

REPORT

OF THE

MEDICAL DEPARTMENT

OF

KEDAH AND PERLIS

FOR

1936

ВУ

J. PORTELLY M.D., D.P.H., D.T.M. & H.

STATE SURGEON, KEDAH.



Allor Star:

PRINTED AT THE KEDAH GOVERNMENT PRESS.



REPORT

OF THE

MEDICAL DEPARTMENT

OF

KEDAH AND PERLIS

FOR

1936

BY

J. PORTELLY M.D., D.P.H., D.T.M. & H.

STATE SURGEON, KEDAH.



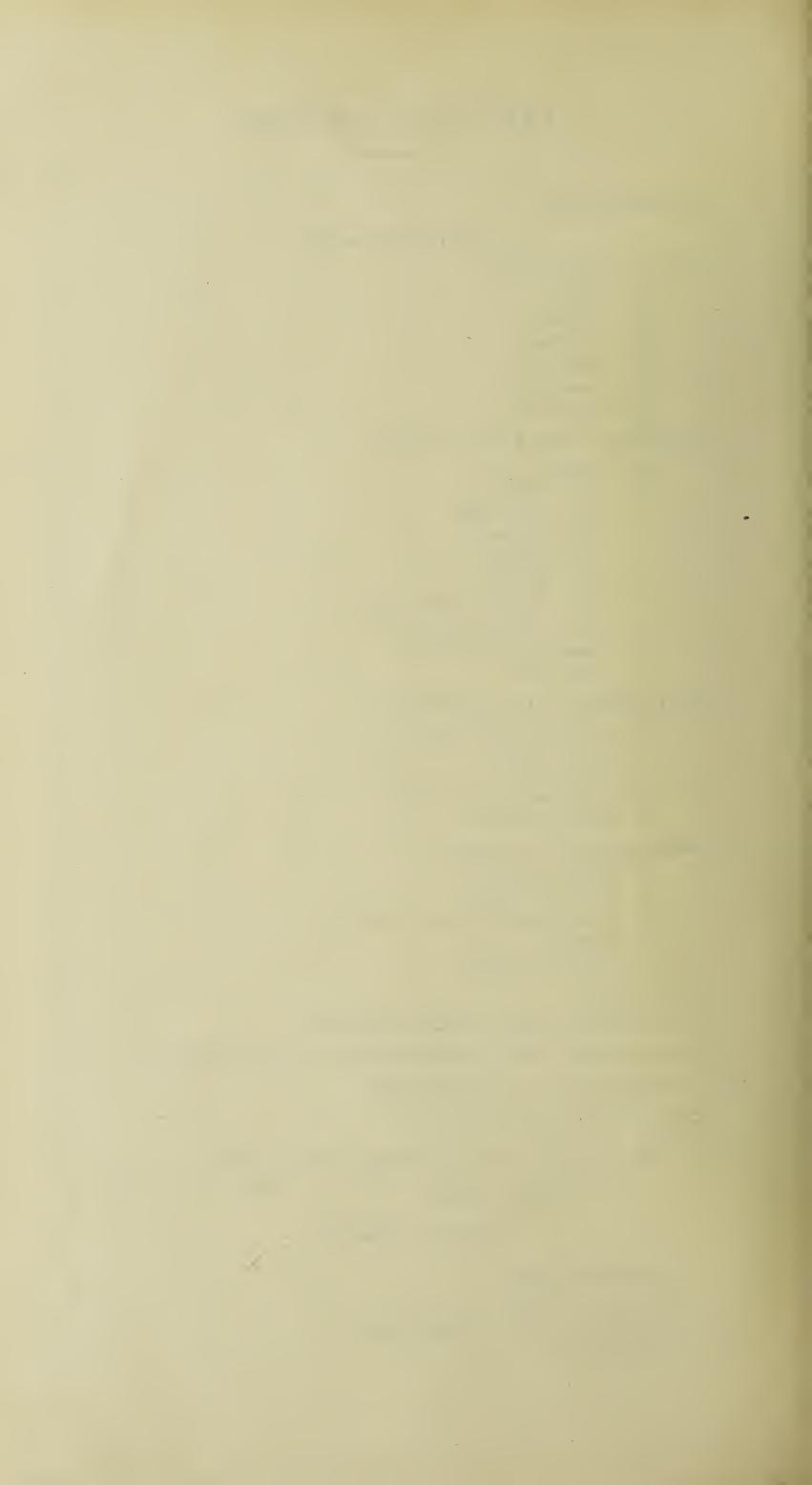
Alor Star:

PRINTED AT THE KEDAH GOVERNMENT PRESS.



TABLE OF CONTENTS.

				PAGE
INTRODUCTION	• • •	• • •		i
KEDAH REPO	ORT.			
I.—ADMINISTRATION	\ - \			1
$(a) STAFF \dots \dots$	• • •	• • •	• • •	1
(b) Changes	• • •	• • •	• • •	1
(c) LEGISLATION	• • •	• • •	• • •	$\frac{1}{2}$
(d) FINANCIAL	• • •	• • •	• • •	$\frac{1}{2}$
(e) Institutions	• • •	• • •	• • •	3
(f) Buildings	• • •	• • •		3
II.—PUBLIC HEALTH (IN GENERAL)				3
A. GENERAL	• • •	•••	• • •	3
B. VITAL STATISTICS	•••	•••	• • •	4
(a) Population	• • •	• • •	•••	4
(b) MIGRATION	•••	•••		4
(c) Births	• • •	• • •	• • •	5
(d) Deaths	•••	• • •	• • •	5
(e) Infantile Mortality	• • •	•••	• • •	5
(f) "EARLY DEATHS"	• • •	• • •	• • •	5
C. COMMUNICABLE DISEASES	• • •	• • •	• • •	5
(Malaria)	•••	• • •	• • •	8
III.—HYGIENE AND SANITATION	• • •	• • •	•••	9
A. SANITARY BOARDS AREAS	• • •	•••	•••	9
B. Controlled Building Areas	• • •	•••		11
C. Rural Areas D. Government Departments	• • •	• • •	• • •	11
D. GOVERNMENT DEPARTMENTS E. BURIAL GROUNDS	• • •	•••	• • •	11
	• • •	•••	• • •	11
IV.—INDUSTRIAL HYGIENE	* * *	•••	• • •	11
A. Rubber Estates	• • •	• • •	• • •	
B. MILLS AND MINES C. VITAL STATISTICS ON A. AND B	• • •	• • •	• • •	
D Cryppar		• • •	• • •	
E. RICE CULTIVATION	• • •	• • •	• • •	7./
V COLLOCIO	• • •	•••	• • •	
		***	•••	15
VI.—MATERNITY AND CHILD WELF	FARE	•••	• • •	25
VII.—HOSPITALS AND DISPENSARIES	S (MISCE	ELLANEOUS)	• • •	26
VIII.—PATHOLOGICAL LABORATORY				30
	•••	• • •	•••	
IX.—METEOROLOGICAL NOTES	* * *	• • •	•••	32
APPENDIX A.—(SHORT NOTES ON SPECIAL	HEALTH	Survey)	• • •	33
" B.—(Professor Tratman's Repo	RT ON DI	ENTAL CONDITION	ONS	
in Rural Kedah)	• • •	•••	• • •	35
PERLIS REPO	RT.			
I.—ADMINISTRATION	•••	•••	• • •	37
II.—PUBLIC HEALTH	• • •	• • •	• • •	38
III.—HOSPITALS AND DISPENSARIES	• • •		• • •	45
IV.—APPENDICES	• • •		• • •	50



INTRODUCTION.

A. It may perhaps be deemed appropriate to outline the scheme of development which has been initiated this year, a scheme which involves several innovations of which no results can be made apparent in the report on the year under review but can only bear fruit in the future.

Some parts of the scheme have actually been put into effect; a few, however, although approved by Government, cannot materialize before the beginning of the next financial year, when the provision made for them will become effective. They are mentioned here as they form part of one scheme, all the elements of which are closely interrelated.

- 1. The Kedah Health Department, still under the control of the Senior Health Officer, has been remodelled so as to comprise three distinct divisions, North, Central and South Kedah, each division forming a separate unit under the charge of a responsible officer, a Health Officer or an Assistant Health Officer, who will be concerned totally and exclusively with all the Public Health duties of his respective district.
- 2. Midwives—A *kampong* midwife service has been instituted, the idea being to have a considerable number of government-subsidised midwives stationed in *kampongs*. The pupil midwives are being trained at the maternity clinics of two of the State Hospitals. It is hoped that this service will be gradually very widely extended. Its main object is to strike a direct blow at the very heavy infant mortality in *kampongs*, and to lay a sound foundation for the establishment of Welfare Work on lines suitable to the special peculiarities of this State.

Other developments in this direction involve the control of the activities of private midwives in the larger towns by enacting legislation in the shape of a "Midwives Enactment" which will shortly become law.

Facilities for Government Hospital Midwives to attend cases outside the hospital have also been considerably enhanced.

3. The establishment of a Dental Clinic in Kedah for which a new up-to-date building is being erected, may merit mention. Approval for a modest beginning with a locally qualified dentist has been granted. This officer will concentrate his activities on the requirements of school children, but his services will also be available to all Government officials. The Clinic will be at Alor Star, but visits to all parts of the State by the Dentist, who will be provided with portable equipment, will be organised.

Control of the practice of dentistry by private individuals is being effected by the introduction of a "Dentists Enactment."

4. Considerable extension of the Outdoor Dispensary service—Approval has been granted for the employment of more dressers with a view to training for this special work. It is hoped that additional dispensaries, especially in thickly populated but comparatively inaccessible centres, will soon be opened.

The importance of this service, especially in a State like Kedah, with such a large Malay agricultural population, whose conversion to hospitalization cannot be even remotely visualized, is very great.

Closer touch of the Medical Department with the inhabitants of outlying districts is going to be effected also by improving on the present Travelling Dispensary vehicles, which, owing to their size, are unable to leave the metalled roads. Provision for three specially built very light vehicles has been made; they will travel over rough roads, and the effective range of action of the travelling dispensary service will be considerably extended thereby.

5. Other developments of importance, but which do not form an integral part of the "scheme", need only be mentioned here. They are:

Reorganization of the vaccination service.

Various alterations in the internal administration of the hospitals.

Legislation for rendering more stringent the provisions of the Poisons Enactment.

- B. The Senior Health Officer (Dr. Vickers) has been responsible for two large scale investigations of very great importance, namely, a Health Survey of the State, and a Special Investigation of Malaria in rice field areas. The material and the information collected are of too great a value to be merely incorporated in the body of this report, and a special report by Dr. Vickers on each investigation is being printed separately. Succint reference to this report is made in Appendix A. (page 33).
- C. In June an Agricultural Exhibition was held at Alor Star. A section for hygiene instruction and propaganda was allotted to the Health Department. This Health Section participated fully in the general success, and attracted vast crowds who listened very attentively to the demonstrators' explanatory discourses. Excellent models showing malaria control, village sanitation, home hygiene, food hygiene, etc., proved very instructive; whilst posters with illustrations or popular slogans, together with demonstrations of microscopic preparations and cinema exhibitions of "medical" films, enhanced the attractiveness of the Health Section.
- D. Prof. E. K. Tratman of the College of Medicine, Singapore, carried out an investigation of the oral conditions of *kampong* people in comparatively inaccessible regions. His findings are of very great interest, and, with his kind permission, his report is reproduced *in toto* as Appendix B. (page 35).
- E. An investigation on the relative value of the various common remedies used in Beri-beri has been organised. The Hospital in each of the three main divisions of the State is investigating one particular line of treatment; thus North Kedah is using gingelly oil, Central Kedah crude rice polishings as obtained from the local mills and South Kedah marmite. Each hospital is using Tawgay (germinating legumes) in addition in order to obviate the possibility of irreparable harm being caused to the patients. Tawgay, being a common factor in the experiment, will not vitiate the results, although it may belittle the difference in the values of the substances under investigation. The "value" under investigation is the combination "economy and therapeutic efficiency."

REPORT OF THE MEDICAL DEPARTMENT, KEDAH.

FOR THE YEAR 1936.

For the purpose of departmental administration the State is divided into four districts viz. North, Central, South and the Island of Langkawi with the adjoining islands.

*>0<

North Kedah has an area of 1,549 square miles with an approximate population of 238,600.

Central Kedah has an area of 1,546 square miles with an approximate population of 128,000.

South Kedah has an area of 553 square miles with an approximate population of 85,500.

The Island of Langkawi and the adjoining islands have an area of 59 square miles with an approximate population of 11,800.

I. ADMINISTRATION.

(a) STAFF.

The principal appointments are:—

The State Surgeon (Head of the Medical Department).

The Senior Health Officer (and State Registrar of Births and Deaths).

- 1 Health Officer.
- 2 Medical Officers.
- 1 Lady Medical Officer.
- 1 Pathologist.
- 1 Assistant Pathologist.
- 7 Assistant Medical Officers.
- 3 Nursing Sisters.
- 4 Nurses.
- 51 Dressers.
- 4 Laboratory Assistants.
- 1 Dispenser-Storekeeper.
- 8 Midwives.
- 4 Vaccinators.
- 5 Health Inspectors attached to the Health Office.
- 13 Health Inspectors attached to the various Sanitary Boards.

(b) CHANGES IN THE STAFF.

Dr. J. Gray, State Surgeon, proceeded on leave prior to retirement on 20th March and was relieved by Dr. J. Portelly.

Dr. H. J. Lawson, Medical Officer, South Kedah, proceeded on leave on 17th April and was relieved by Dr. M. P. O'Connor.

Dr. Mabel G. Brodie, Lady Medical Officer, proceeded on leave on 21st November. She was relieved by Dr. E. M. Hopkins.

Dr. M. B. Osman, Government Pathologist, resumed duty on return from leave on 27th August.

Dr. E. D. B. Wolfe was posted on special duty to Kedah as Health Officer on 1st November.

Dr. Low Thean Loy, Assistant Medical Officer, proceeded on leave on 5th September.

Dr. Tan Joo Cheng, Assistant Medical Officer, proceeded on leave on 22nd October.

Dr. P. T. K. Nayar, Assistant Medical Officer, returned from leave on 29th October.

Dr. J. M. Daniel, assumed duty as temporary Assistant Medical Officer on 16th May.

Nursing Sister D. Smith proceeded on leave on 28th March. She was relieved by Nursing Sister H. V. Fisher.

Nursing Sister A. A. Gentles proceeded on leave on 4th September and was relieved by Nursing Sister E. M. Smith on 3rd December.

Nursing Sister D. V. McKenzie proceeded on transfer to Singapore on 3rd December. She was relieved by Nursing Sister D. Smith who returned from leave on 17th December.

The following officers carried out the duties of their respective posts throughout the year:

Dr. W. J. Vickers—Acting Senior Health Officer.

Dr. J. H. Strahan—Health Officer.

Dr. S. J. Campbell-Medical Officer.

Drs. S. M. Kumarasamy, M. R. Bhandari, S. K. Kelkar and Low Chin Seang—Assistant Medical Officers.

Dr. V. G. Patwardhan—Assistant Pathologist.

(c) LEGISLATION.

Legislation having a bearing on subjects with which the Medical Department is concerned was passed as follows:—

1. New Enactments:

Children Enactment-No. 21.

Prisons (Amendment) Enactment of 1355.

Workmen's Compensation (Amendment) Enactment of 1355.

Health Board (Amendment) Enactment of 1355.

2. New Rules—under:

Registration of Schools Enactment—No. 98.

Health Board Enactment-No. 48.

Labour Code.

3. Notifications—under:

Labour Code.

Sanitary Boards Enactment—No. 106.

- (a) Altering S.B. areas.
- (b) Declaring anti-malaria areas.
- (c) Declaring controlled building areas.

4. Amendment of Rules under:

Chandu Enactment—No. 16.

Workmen's Compensation Enactment-No. 134.

Prisons Enactment—No. 84.

Sanitary Boards Enactment—No. 106.

5. The "muzzling" order under Rule 35 of the Quarantine and Prevention of Diseases (Animals) Enactment has been in force throughout the year.

(d) FINANCIAL.

Revenue for 1935 and 1936 was \$12,721 and \$14,690 respectively; while the expenditure for the same two years was \$430,617 and \$491,133 respectively.

During 1935 the \$430,617 was expended in Personal Emoluments (\$223,437) and Other Charges (\$207,180); whilst the corresponding figures for 1936 were \$247,240 and \$243,893 respectively.

(e) MEDICAL INSTITUTIONS.

NORTH KEDAH.

General Hospital, Alor Star ... · 300 beds. Out-Door Dispensary, Alor Star Town. Malay Women and Children Dispensary, Bakar Bata.

Out-Door Dispensary, Jitra.

Changloon.

Kuala Nerang.

Yen.

CENTRAL KEDAH.

District Hospital, Sungei Patani .. 285 beds. Baling ... 28 Out-Door Dispensary, Sik.

SOUTH KEDAH.

District Hospital, Kulim 200 beds. Out-Door Dispensary, Bandar Bahru.

Langkawi.

District Hospital, Kuah 63 beds. Out-Door Dispensary, Padang Masirat.

There is an Out-Door Dispensary at each hospital.

North, Central and South Districts are provided with Motor Travelling Dispensaries by which visits are regularly made to schools, villages and Police Stations accessible by road.

In Langkawi Island the Assistant Medical Officer or Dresser visits all villages every month by sea or road distributing medicines, vaccinating, giving injections and inspecting schools.

(f) BUILDINGS.

A new up-to-date Town Dispensary at Alor Star, and a new admission ward, with dispensary and laboratory attached, at the District Hospital, Kulim, were completed during the year.

A set of store rooms at the General Hospital, Alor Star and quarters for various officers were nearing completion at the end of the year.

PUBLIC HEALTH. Η.

A. GENERAL.

An expansion of the activities of the department especially in connection with rural hygiene and the control of malaria is recorded. These items are reviewed fully in the special publication outlined in Appendix A on page 33.

Apart from these special studies, however, malarial control in general received much added attention. Human bait traps were started in two additional centres, making a total of three investigation centres in all. The Anti-Malarial control previously exercised in the State was quadrupled during the year under review. All inspecting and investigating work was developed along modern scientific lines as far as the small staff and funds available permitted. This was necessarily limited as, apart from the chief inspector, the dissector and two collectors, the rest had to be trained. Nevertheless mosquito dissections and blood examinations increased from nil in 1934 to 9,805 and 11,506 in 1935.

The year 1936 can be said to have been a healthy one in general.

No epidemic manifestation was observed. Of the major communicable diseases, no cholera, plague or smallpox was reported, while the considerable increase in incidence recorded for malaria during 1935 was not repeated.

The water supplies of the State received further attention and action has now been started to improve the existing supplies, only one of which is filtered and chlorinated. Many areas are without an adequate and safe drinking water, and, while this problem remains a part of the Health Survey, the more urgent cases are receiving attention.

Urban areas also received considerable attention during the year, and a definite and sustained effort was made to improve conditions in the nine Sanitary (or Town) Boards. Such action was particularly necessary in two of the largest towns, Alor Star and Kulim.

B. VITAL STATISTICS.

As the Mohammadan Calendar was in force up to 1929, and the "Balancing Equation" method of population calculation (Census + Births — Deaths + Migration surplus) was substituted for the Geometrical in 1935, rate comparison with previous figures is limited to the following:—

		Population	Bir	тнѕ	DEATHS			
	Year			Mid-Year	No.	Rate per mille	No.	Rate per mille
1931	(Census year)	•••	•••	433,100	15,615	36.05	9,129	21.10
1935 1936	•••	•••	• • •	452,554 463,894	16,713 18,638	36·93 39·50	10,299 10,683	22·75 23·00

INFANTILE DEATHS.

Year.		•			Number.	Rate per mille.
1931				 	1,907	122
1935	• •		• •	 	2,469	147
1936	• •		• •	 	2,667	145

Detailed statistics for the year 1936 will be found in the Tables listed on page 15.

(a) Population.

The year's population figure of 463,894 indicates an average yearly increase of 6,160 since the last Census period (1931). It will be observed that as noted in last year's report the Malay section of the population is still estimated to comprise some 70% of the total, the Chinese some 18% and the Indian some 11% as compared with 67% for the Malays, 18% for the Chinese and 12% for the Indians for the 1931 Census and 70% Malays 18% Chinese and 10% Indians for the year 1921 Census. The interesting fact is thus disclosed that the various sections of the population have apparently retained the same relative proportions during the last 25 years.

The present sex rates cannot, unfortunately, be worked out, as male and female estimations are not available, but, from the Census enumerations, a marked improvement in the general sex ratios is recorded, from 135 males to 100 females in 1921, to 124 males to 100 females in 1931.

The towns and villages continue, except the capital, Alor Star, to be the main centres of Chinese population, and it is estimated that over 90% of this race are to be located in such areas. Only some 6% are rubber estate coolies, while the few mines absorb little labour. Although all the rice mills of the State, some 16 in number, employ Chinese labour (approximately 500 persons), rice cultivation is almost entirely in the hands of the Malays. Thus Central and South Kedah harbour most of the Chinese population. Although it is impossible now to estimate the population by districts from the material available, it is without doubt still true that all are predominantly Malay except Kulim, Bandar Baharu and Kuala Muda.

A Health Survey of the State and a Special Malaria Investigation clearly indicate that the Malay is in the main a rural dweller: the Chinese as noted above is urban. The 10% in the kampongs merely act as shop-keepers and bankers. Only some 4% of the Malay race appear to work on rubber estates and mines, that is in organised industry. Apparently the Indian in this State is to be found in almost equal numbers on the rubber estate and in the village and town.

There are only three towns in Kedah with a population of over 5,000, namely Alor Star (24,621), Sungei Patani (10,123) and Kulim (7,505).

(b) Migration.

While for the period 1st July to 31st December, 1934, the immigrational surplus was estimated at 8,126 with a deficit of 7,676 for the period 1st January to 30th June, 1935, the corresponding figures from 1st July to 31st December, 1935 and 1st January to 30th June, 1936 are immigrational surpluses of 2,162 and 1,205 respectively. It is thus seen that immigration is on the increase in accordance with the improved economic situation.

(c) Births.

The number of births registered in the State during the year was equal to a crude birth rate of 39.5, an increase of some 3 per mille over last year and recent years. This is a satisfactory feature. Of the birth registered during 1936, 8,982 were of females and 9,386 of males, compared with 8,620 male births and 8,093 female births during 1935 respectively. The male births again exceeded the female for the three principal races. The Malays again registered almost four times the number of births registered by the Chinese and nearly seven times the number registered by the Indian communities. The Chinese registered almost double the Indian number. Nevertheless the rate per mille is still highest for the Chinese (Table III on page 16).

The 1931 Census figures indicate that total female fecundity is most marked in the Chinese (roughly 16: 12: 10 for Chinese: Indian: Malay), a fact which, in all probability, would be further stressed by only considering the child bearing age periods. (These figures are not available for recent years, as population by sex and age period is not recorded).

Still-births were again by far the most marked amongst the Malays (Table IV page 16)—76% of the total recorded. In general there was 1 still-birth to every 19 normal births, as compared with 1 to 19 in 1935 and 1 to 17 in 1934.

(d) Deaths.

10,683 deaths were registered during the year giving a crude death rate of 23.0, as compared with 22.75 in 1935. Although this rate shows a rise of some 4 per mille over the estimated 1932, the most favourable recent figure, it is difficult to calculate the exact significance of this in view of the considerable movements of Indian and Chinese labour during the slump period. A study of the figures for the most stable section of the population, the Malay, during this same period shows but little variation.

There were more male deaths at all age periods except the 25—30 period, when female deaths predominated. Roughly, one quarter of the total deaths were recorded in infancy (under one year), one quarter at the age period 20—50 and one quarter for 50 years and over. The principal "fatality" diseases among persons of all ages in order of frequency were:—

	Disease			Approximate percentage of Crude Deaths				
				1936	1935	1934		
Fever unspecified	•••	• • •	•••	36	42	41		
Malaria	• • •	• • •		12	4	2		
Premature birth	• • •		•••	10	12	11		
Convulsions		•••	•••	10	10	12		
Old age	• • •		• • •	10	9	8		
Respiratory diseases (ex	xeluding T. B.)	•••		6	7	7		
Others	•••	• • •	• • •	16	16	18		

(e) Infantile Mortality.

The crude infantile mortality rate (number of deaths under 1 year of age per 1,000 live births) over the last five years was as follows:—

1931	• •	 	 	 122
1932	• •	 • •	 	 120
1933	• •	 	 	 141
1934	• •	 	 	 148
1935		 	 	 148
1936	•	 	 	 145

It will be seen that, here again, the 1932 figure was the most favourable and that there has been a disconcerting rise since that date.

A study of the mortality at different age periods sufficiently indicates how heavy this is in infancy. Again almost 50% of the infantile deaths occurred during the first month of life.

The principal causes of death of infants reported in order of frequency, were:

Disease.			Approximate percentage of to infantile deaths.				
				1936.	1935.		
Premature Birth			 	31	48		
Convulsions			 	32	30		
Fever Unspecified	• •		 	20	10		
Diagnosed Malaria			 	2	2		
Bowel Disease		• •	 	2	2		
Pneumonia	0 0		 	5	4		

The highest rate was again shewn by the Indian Community (170) but this year the lowest was taken by the Chinese (135), the Malays being (148). The Malay rate has appreciably increased (136 in 1935). The Indian and Chinese have considerably decreased, however, (226 and 148 respectively in 1935), a fact which is of considerable interest when taken in conjunction with the Infantile Mortality Rate on estates.

With reference to the Indian rate, 261 of the 328 deaths recorded apparently occurred amongst estate labour in which the infantile death rate fell from 242 to 192 during the last twelve months as compared with a rise from 222 during the previous twelve months. Of the Indian infant deaths for the State the principal diseases were as follow:-

> Approximate number of total Infantile Deaths.

Premature Births					115
Convulsions					75
Fever Unspecified	• •	• •	• •		37
Pneumonia and Bronchitis			• •	• •	34
Bowel Disease		• •	• •		30
Malaria (Diagnosed)	• •	• •			18

Reference should be made to the estate section for further comment on these figures.

(f) Early Deaths.

Early deaths and sickness in early life stand out far too prominently. Some 45% of the deaths in the State apparently took place in the 0—20 age period, while over 25% occurred during the first twelve months of life. The large amount of ill health which must have occurred coincidently with these deaths must be a leading cause of indifferent health and permanent physical defect of many of the survivors in their later years, a fact which has been amply borne out by the examination which has been carried out in various areas during the year in connection with the Health and Malarial Surveys of the State.

C. PREVALENCE OF, AND CONTROL OVER, COMMUNICABLE DISEASE.

Communicable Disease Generally.

All diseases which appeared to have any present practical bearing on the local public health received attention during the Health Survey. These will thus be found reviewed in the special report referred to on page 33.

Suffice it to say here that each case of communicable disease reported to the Health Department was fully investigated and all necessary action taken to prevent spread and to allay public alarm. No epidemic manifestation was observed during the year. Of the major communicable diseases no case of small-pox, cholera or plague was reported although one or two scares in connection with the former two diseases occurred.

Small-pox.

Although no small-pox has been reported in Kedah since the year 1932, it is not certain that the population is sufficiently vaccinated to ensure absolute protection. Steps are now being taken to re-organise the entire vaccination procedure, as considerable powers of compulsory vaccination exist under the present law and an outbreak of the disease must be considered an ever present danger. In such a community as this a well vaccinated state can be said to be the only true safeguard.

Cholera.

This disease also has not been observed for some ten years. Nevertheless it is a constant menace to the local public health as it is endemic in the bordering Kingdom of Siam.

A watch is kept at the Quarantine Station of Padang Besar where an Assistant Health Officer is stationed and isolation wards and a steam disinfector are maintained. During the year existing regulations were examined, revised and more stringently enforced. All immigrant labour from Penang is dealt with at the Quarantine Station there before distribution.

Quarantine Camp, Padang Besar.

Number of passengers examined:—

Class			1933	1934	1935	1936
1st class	• • •	•••	1,055 .	1,186	1,299	1,127
2nd class	• • •	• • •	959	1,179	1,675	1,432
3rd class	•••	• • •	6,949	7,977	10,859	10,194
	TOTAL		8,963	10,342	13,833	12,753

January appeared to be the month during which passengers were most frequent (1,681). June gave the lowest return (717).

Plague.

No case of this disease has ever been notified and no anti-plague measures have been enforced. As anti-rat measures considerable efforts were made during the year to clear up food and storage premises within Sanitary Board Areas and to improve refuse collection and disposal.

The following Table indicates the incidence of reported communicable disease by nationality for the years 1935 and 1936.

Diseases		Malays	Deaths	Chinese	Deaths	Indians	Deaths	Non-	Deaths	Others	Deaths		otal +35		otal 936
		1935	1936	1935	1936	1935	1936	1935	1936	1935	1936	Case	Deaths	Case	Deaths
Fever unspecified .		3,327	2,909	671	537	213	124			108	131	?	4,319	?	3,701
Malasia		172	756	134	241	90	171		2	11	28	2	407		1,198
Ohialran nav			• • •		• • •							157		103	
Entonia		21	9	6	3		3		• • •	2		5±	29	38	15
Dysentery an	d													0.0	2.0
diamele		53	75	53	71	90	70			4	4	425	200	315	220
Influenza		25	40	3	9	2	5			1	4	625	31	970	58
Diphtheria			• • •	2	6				•••			3	2	12	6
Measles .		• • •	•••	• • •	• • •	•••						409		22	
Whooping Cough .		• • •	•••						• • •		1	62		31	2
Longogy		1	} •••	• • •	• • •	• • •	• • •	•••				67	1	59	1
Pneumonia		24	33	52	55	158	119					598	234	554	207
Pulmonary Tube	r-														
culosis .		35	36	77	73	36	54		• • •	6	3	?	154	?	166
Puerperal Fever .		151	224	37	41	27	20	• • •	• • •	5	6	?	220	?	291
Erysipelas .	• • •	• • •	• • •		•••	• • •		• • •				9	5	8	1
Totonna		• • •		•••	•••				•••			1	• • •	2	1
Tropical Typhus .		• • •	• • •		• • •		•••			• • •		• • •		3	• • •
						1									
											MARKET THE CO.			'	

Vaccinations carried out on estates during the year compared as follows with previous years:—

Yea	1.	No. of persons Vaccinated	No. of tubes used	No. successfully done	Percentage successful
1933	•••	811	80	667	82
1934	•••	753	111	670	90
1935	•••	574	113	438	74
1936	•••	592	110	521	88

MALARIA.

(a) Malaria in General.

Diagnosed malaria accounted for some 1,198 deaths or 12% of deaths from all causes as compared with 4% in 1935, while 4,899 deaths or 46% of the total deaths recorded were reported as due to malaria and fevers of undefined origin (46% in 1935). The death rate per mille from possible fever causes remained at 13: 13: 8 for Malays, Chinese and Indians.

No epidemic of malaria is to be recorded, although a study of the special investigations carried out in the State during the year will clearly indicate that endemic and even hyper-endemic areas exist.

Apart from estates—dealt with in a following section—the three largest towns continued to be controlled in part, while certain dangerous areas elsewhere were subsoiled and certain small populations dealt with by drug prophylaxis. Any cases reported from amongst these controlled populations were carefully investigated.

It would appear from these figures and facts that there has been a definite decline in the incidence of this disease during the year under review, an observation which is amply borne out by a study of the returns from estates, the latter being the only source of the statistical information available for comparison purposes. It appears from these to be clear that the very considerable peak reached during the 1934—1935 period—the culminating point of an apparent wave—is now receeding (Table IX page 18).

There is no doubt that better and wider control on estates by anti-larval and drug prophylaxis must effect the comparative yearly figures in the controlled areas of the State. The 1935 scare had a marked effect on the planting community. A glance at Table IX shows the increased use of Hospitals now as compared with past years, for instance. It is nevertheless certain that this disease still remains the most important cause of sickness and death in this State. A special study was made of "paddy" malaria. When it is realised that some 240,000 acres are entirely given up to rice cultivation in Kedah: that this State is by far the most important producer in this connection in the Malay Peninsula: that rice is one of the main foods of the local population: and that the cultivation is carried on in close proximity to important centres of population, its bearing on the malarial problem becomes one of considerable magnitude and importance.

The organisation of the Anti-Malarial Department commenced during 1935 was continued during this year. By the end of the year it consisted of a Chief Inspector, a Dissector, 2 Probationer Inspectors, a Field Assistant, two permanent and two temporary Mosquito Collectors, a considerable increase in the two collectors only available at the end of 1934.

An attempt was made to carry out all work on modern and research lines as far as possible. Thus mosquito trapping and dissection were features of all investigations.

A considerable amount of permanent Anti-Malarial work was undertaken during the year. A highly dangerous seepage ravine near the main hospital in South Kedah (Kulim) was thus very satisfactorily dealt with at a cost of some \$3,500.00; much old subsoiling work was renewed and extended in South and Central Kedah and a scheme in operation in North Kedah was improved. This type of work—the ideal in hilly country—will be continued as funds permit. Chemio-Prophylaxis was continued at the frontier Quarantine Station at Padang Besar, at the frontier Customs Station at Bukit Kayu Hitam, at a certain P.W.D. Cooly line and a Malay Kampong in highly malarious areas and on an increasing number of estates.

The following procedure was adopted anent the Government staffs concerned:—

- (a) A five day course of Atebrin (3 tablets of 0.2 grams daily) and Plasmochin (1 tablet of 1/16 grams daily) to those with positive bloods or 30 grams Quinine B'hydchl. daily for seven days. (Respectively adults: children in proportion).
- (b) Follow up drug treatment during the malarial season of 2 tablets of Atebrin on 2 consecutive days (0.4 grams daily) per week or 6 grams Quinine B'hydchl. daily. (Adults: children in proportion).

No ill effects were observed and excellent practical results were obtained.

Mosquito dissections rose from Nil in 1934 and 1,343 in 1935 to 9,805 during the year under review. Blood examinations rose from almost Nil in 1935 to 11,506 in 1936. Spleen examinations (apart from rubber estate examinations) increased from 4,470 in 1935 to 16,573 in 1936.

No attempt was made to control mosquito nuisance. No efforts will be made in this direction, or are indeed possible, until malarial control has been much more carefully investigated and advanced.

(b) Malaria on Estates.

10,377 cases of malaria and unspecified fever were reported in 1936 as compared with 18,200 in 1935. Table X on page 19 sums up the Malarial Statistics on estates for the current year.

(a) European Holdings.

The case incidence per mille fell from 473.6 in 1935 to 264.6, while the malarial death rate fell from 3.2 per mille to 2.5. The Hospital admission rate for all fever cases rose from 47.6 to 55.7. This is a trend in the right direction but is still far from satisfactory. 13.2% of the total deaths were caused by malaria. Case fatality per cent for hospital cases was 1.6 compared to 1.1 in 1935 while the lines fatality rate fell from 0.27 to .1%. It may be said that this is a much more satisfactory position than that of the previous year.

(b) Asiatic Holdings.

It would be wearisome to discuss again in detail the difficulties in the interpretation of the statistics of this section as has been done in previous years.

One or two points emerge, however. While the total population on these holdings has fallen by 2,000 (due to closure of those estates preferring to sell their coupons rather than tap), hospital admissions have increased from 361 in 1935 to 381 in 1936, the total cases notified remaining at approximately the same figure. In other words, in a year of low malarial incidence, Asiatic holdings from a decreased population reported the same number of cases of malaria and admitted a higher percentage for hospital treatment. This would appear to indicate a better notification and an increased use of the Group Hospitals.

Allowing that 40% of the population employed were *kampong* residents who do not record their vital statistics in these returns, the corrected malaria death rate is in the region of 3 per mille. Lines fatality rate is still far too high.

For every 1,000 cases treated in the lines on European holdings 1 died, compared to 23 on Asiatic holdings.

It may be said however that in the year under review there was an improvement (which is being steadily maintained) in the care of the sick on the Asiatic holdings.

III. HYGIENE AND SANITATION. A. SANITARY BOARD AREAS.

(1) General.

There are nine districts so defined in the State (including one in Langkawi Island). These cover the main population centres and so act as Town Boards. Each area has been specifically gazetted and the full sanitary control allowed by the existing law can be exercised in each.

(2) Sewage Disposal.

Action was taken during the year to see that every house, including *kampong* houses, wherever possible, was supplied with a Sanitary Board type latrine.

The improved supervision schemes approved at the end of last year commenced to operate.

Finally consideration is now being given to proper lorry removal schemes with bucket washing and a double bucket system for the larger towns, while for Alor Star some sewage removal scheme on even more modern lines is under examination as the high level of subsoil water always present in this area makes satisfactory night soil trenching a difficult and expensive project.

It is thus seen that an important move in the right direction was made in the year under review. It is hoped that the further very marked improvement foreshadowed in this most important section of town hygiene will be an accomplished fact by the time the next Annual Report is written.

The standard type of latrine approved for the State last year was made to replace the several types in use previously, and all pits were closed.

(3) Refuse Disposal.

The new Incinerator for Sungei Patani completed towards the end of last year continued to give satisfactory results, while a new plant was approved for the capital, Alor Star. Work will commence on this in the near future. Incinerators were also completed for some of the smaller Sanitary Boards during the year.

"Controlled tipping" was tried out in Alor Star at the request of Government, but proved a failure owing to the flat nature of the countryside, the high level of subsoil water and the peculiar nature of the clay soil which created a pungent smell on excavation. Fly nuisance also resulted partly from lack of proper supervision. This method is being continued in smaller and more suitable areas with more success, however, but entire success and absolute freedom from danger are problematical.

The new public dustbins designed last year with concrete standings continued to be installed, and each house holder was requested to supply himself with a definite type of small bin. Rubbish was removed by lorry or bullock cart from all houses and removal schemes were re-organised. A definite progress is thus to be recorded in this section.

(4) Water Supplies.

Although no actual improvement has been effected to the water supplies to the main centres of population, considerable attention was devoted to the subject during the year under review owing to the inability to obtain a stabilised water.

As only eight of the largest towns and villages together with the rural population surrounding them and living along the pipe lines receive a piped water supply from upland streams, a very limited portion of the people of the State are thus supplied.

The following are average analysis results from two typical piped supplies:—

	a	b
Probable No. of Coli-aerogenes organisms in 100 ml. wa	ater 900	. 130
Probable No. of Colonies per ml. after 48 hours at 37°C	145.	. 550
Probable No. of Colonies per ml. after 72 hours at		
room temperature	300	. 1,370

Typical B. Coli isolated in each.

(5) Food in relation to Health and Disease.

(1) Markets.

Improvements and additions were carried out in certain smaller markets, while those operating in the larger towns received considerable attention, being enlarged and partially reconstructed. An improved type of stall has also been designed for use in all markets.

(2) Slaughter-houses.

Action was taken in conjunction with the State Veterinary Surgeon to improve the slaughter-houses to be found in all the larger Sanitary Board areas, while in Alor Star it is proposed to rebuild those in exsistence on modern lines.

(3) Cattle Sheds.

Very few cattle appear to be kept in urban areas. The sheds in existence were removed to a Controlled Building Area and made to conform to sanitary requirements.

(4) Restaurants and Eating Shops.

All these were subject to examination and licensing, and a definite and considerable improvements is to be recorded with regard to their sanitary condition during the year. Action was taken to eliminate the temporary shop as far as possible in this connection as it has been found impossible to render such premises continually sanitary.

(5) Street Stalls.

Street stalls caused the usual trouble in control but action was taken to eliminate the most unsatisfactory, while the rest were made to conform to the bye-laws and also to confine themselves to certain specified areas. All are now licensed and examined at regular intervals. While a lot still remains to be done to enforce continued sanitary satisfaction, conditions in this respect may be said to have definitely improved.

(6) Hawkers.

It has now been ruled that all food hawkers will be licensed as from next year, and a bye-law has been passed to this effect. It is hoped by such means to keep the numbers within bounds and to enforce a reasonable sanitary standard in food production.

(7) Unlicensed Food Premises.

Such manufacturing premises as aerated water works and ice factories are unlicensed and so are difficult to control. Legislative control is now being sought.

(8) Bakeries.

Action was taken to enforce more stringent regulations with regard to all bakeries and to eliminate the really unsatisfactory premises. In Alor Star a proposal is on foot to provide a special area and type of premises for all bakeries.

B. CONTROLLED BUILDING AREAS.

Certain areas in the State have been so gazetted that future building can be controlled. No attempt is made to exercise sanitary control in such districts. Most of the Sanitary Board areas have a Controlled Building Zone beyond their limits and a recommendation has been made by the Health Authority to introduce legislation to extend this principle to 300 feet on each side of all main roads in the State as there is a tendency to the uncontrolled erection of insanitary hovels along our main traffic routes.

C. KAMPONG AND RURAL AREAS.

The special report on the Health Survey of the State will deal fully with this matter.

D. GOVERNMENT DEPARTMENTS.

Police stations and other Government Quarters were inspected as circumstances and staff permitted. Sanitary improvements were indicated to the heads of the various departments concerned as required. The majority of those visited showed a reasonable sanitary standard, but water supplies often offered difficulty, unsatisfactory wells being frequently encountered.

E. BURIAL GROUNDS.

54 burial grounds were inspected during the year and reports submitted to the Land Office.

IV. INDUSTRIAL HYGIENE.

A. RUBBER ESTATES.

Tables IX, X and XIII—XVIII (vide pages 18 to 25) indicate the satistical position for 1936 on all Rubber Estates, Tin Mines, Rice Mills, Sago Mills and Quarries which are controlled under the Labour Code.

Altogether 895 visits were paid to 427 estates compared to 920 in 1935. Thus 81% of all estates on the visiting list were inspected. Quarries worked by contractors for the Public Works Department and F.M.S. Railways were added to the visiting list during the year along with a few small estates which had hitherto escaped inspection. Out of the total of 523 estates on the present register, 88 are European controlled and 435 Asiatic controlled. Each group is considered separately.

(I) European Controlled Estates:—

These comprise 86 Rubber Estates, one Wolfram Mine and two Tin Mines. All, except the Wolfram Mine which was specially mentioned in last year's report, were inspected during the year.

(i) Housing.

29 new sets of lines were erected during the year. These were of the single row type (raised or ground floor) or of the cottage type in groups of 4. One large estate has commenced a complete new programme of 60 rooms cottage type. Three estates have colonies of Malay Kampong houses for Malay labour. These are very popular but a better standard of sanitary arrangements is required. 159 lines were repaired.

During the year all Managers were circularized as to the essential requirements of all new lines, and the "Krescot" type of kitchen patented by Dr. Waugh Scott to prevent burning accidents in children was recommended.

Recommendations for new lines to prevent overcrowding were made on 4 occasions and for major repairs on 10.

(ii) Water Supplies.

The following Table gives an approximate idea as to the quantity of water supplied to labour on European Holdings with the corresponding figures for 1935.

No. of E	Estateș	Approximate	e population	
1935	1936	1935 1936		Water Supply
5	6	3,319	4,081	Chlorinated supply.
15	17	5,525	9,229	Piped supply from catchment areas.
7	7	4,263	3,753	Jewell filters from various sources.
51	15	21,804	7,800	Piped supplies from protected wells.
	35	•••	11,003	Protected wells.
4	2	708	250	Supplies open to pollution.
4	5		• • •	Estates closed or separate divisions incoporated in the larger estates
86	87	35,619	36,016	

Recommendations for three chlorination plants and 8 requests for further well protection were made, exclusive of a chlorinated supply for one Group Hospital.

(iii) Sewage Disposal.

Septic tanks have been installed on 10 estates against 8 in 1935. The Bucket system has decreased from 27 to 19 in favour of trench or bore-hole latrines which have correspondingly increased. One estate has large septic tanks for disposal of the night soil from bucket latrines. Recommendations were necessary for one septic tank system, 3 new sets of latrines and proper night soil disposal on two occasions.

(iv) Anti-Malarial Work.

45 estates practise anti-larval control as against 40 in 1935, while 6 practise anti-larval control and Chemio-Prophylaxis. Seven estates practise Chemio-Prophylaxis only.

It was stated in last year's report that 10 estates required no anti-malarial measures despite favourable breeding conditions. During the year 4 of these estates developed outbreaks of malaria and were brought under anti-larval control measures.

The remaining estates practise no anti-malarial work other than treatment of sporadic cases.

One large Health Board Scheme was commenced during the year to combat a severe outbreak of malaria in the Bedong area affecting three estates and the Group Hospital.

Another outbreak in the Serdang area was controlled by proper screening of the hospital.

A long established Health Board Scheme in the Sungei Tukang area was abolished owing to the successful eradication of malarial breeding places.

In four cases large estates made arrangements to control malarial breeding places on small adjacent holdings which endangered their own labour forces.

A large kampong in Langkawi adjacent to a large estate was successfully treated by Chemio-Prophylaxis to the advantage of both.

Anopheles Maculatus breeding in paddy fields near large estates population centres received special attention during the year and is discussed in the special report on that subject. One estate commenced biological control with cow manure to control this type of breeding place.

One anti-malarial order was issued during the year, but anti-malarial work on the whole was of a higher standard than in recent years.

(v) Dresser Staff.

45 estates employ qualified dressers while 11 estates employ unqualified men. Of these 2 have already sat for and failed the State grade III examination, 4 are preparing to sit on the next occasion while 2 have been exempted in view of their long experience and reliable work.

All Group Hospitals were inspected during the year and the Health Board required the staff of each to be brought up to the scheduled standard where necessary.

(vi) Infectious Disease.

As in the previous year there were no outbreaks of major infectious disease.

The following cases were reported:-

Typhoid	fever		, .			• •			9
Leprosy									5
Phthisis	• •				• •		·		48
Whooping	g Cough				• •		•		30
Measles	• •								10
Mumps									163
Influenza							•	•	796
Chiken-pe	ox						٠	•	70
Erysipela	s						•	•	4
~ ~				·	•	• •	•	•	

Filariasis was further investigated and the results appear in the Special Health Survey Report.

(vii) Care of the Sick.

As usual all deaths occurring in lines and hospitals in which there appeared to be undue delay in admission or failure to admit, were investigated. 57 of these occurred in hospital and 167 occurred in the lines.

(viii) Food. .

All Group Hospital dietaries were scrutinised. In each case they reached a satisfactory standard.

There are only 16 large estates where the labourers do not grow their own vegetables. The most common vegetables cultivated are paddy, ragi, beetle leaf, brinjals, tapioca, chillies, sugar cane, long beans, maize, tobacco, ladies fingers.

(II) Asiatic Holdings.

348 estates were visited out of 438 on the register.

During the year orders were recommended and issued in 213 cases. In order to enforce the carrying out of some of these orders, 18 prosecutions were instituted and fines to the extent of \$240 were imposed.

(i) Anti-Malarial Work.

As discussed in last year's report this aspect of estate work on Asiatic holdings is fraught with almost insurmountable difficulties. On the recommendation of this department, the Health Board has asked Group Associations to employ inspectors with a Royal Sanitary Institute qualification to act as Anti-Malarial Inspectors. Their duties are to assist Group Medical Officers, and to try to organise anti-malarial work. Two groups have employed such men and they are proving useful. Larval surveys on these holdings shew that dangerous breeding is common, and spleen rates are over 20% on a great many of these estates. It is hoped that these Anti-Malarial Inspectors will be able to carry out mass drug treatment and educate the small labour forces on these holdings to this end.

More estates are being made gradually to undertake anti-malarial work. Twelve orders were issued to this effect, 10 of which were complied with. Four European estates commenced anti-malarial work on 4 of these small holdings.

(ii) Care of the Sick.

50 deaths formed the subject of special investigation; of these 3 occurred in hospital.

B. RICE MILLS: SAGO MILLS: TIN MINES.

During the year 16 Rice Mills, 8 Sago Mills, 2 Tin Mines were visited. Recommendations and orders where necessary have been made to bring Rice Mills up to the standard expected on rubber estates.

As far as possible reasonable sanitation in Sago Mills is secured. It was necessary to threaten to close 2 mills to secure obedience. There are only 2 Tin Mines of sufficient size to warrant routine inspection. They comply with reasonable standards.

C. VITAL STATISTICS ON RUBBER ESTATES, RICE MILLS, SAGO MILLS AND TIN MINES.

Tables IX, X, XIII—XVIII (pages 18 to 25) give the statistical data regarding the public health of labour forces employed on the above

The population on European holdings has remained approximately the same as the previous year, while that employed in the Asiatic holdings has decreased by over two thousand. European holdings employ mainly Tamil labour (85%) while Asiatic holdings employ Malay labour (50%) and Chinese labour (30%).

As pointed out in previous reports, returns from Asiatic holdings are relatively valueless, but, comparing returns from the larger European holdings, it will be seen that the crude death rate fell from 23.6 in 1935 to 19.1 in 1936. The Indian death rate fell from 25.7 to 20.4—a very large fall—, due undoubtedly to the smaller incidence of malaria and the stricter anti-malarial methods adopted. The death rate of Indian labourers fell from 10.3 to 9.1.

In accord with this improvement in the general death rate, the infantile mortality rate for Indians has fallen from 240 to 191. This is still very much higher than the infantile mortality rate for the State (145). By far the greater proportion of infant deaths occur in the first month of life and over half of them in the first week. This tends to show that the care of the pregnant woman needs to receive further attention. The birth rate in Indian labour has risen from 39.6 in 1935 to 43.2 in 1936. Hospital admissions have fallen by 4,256—another indication of a healthy year.

D. GENERAL.

In spite of the forecast in last year's report that this section of the department's work would have to be curtailed, it will be seen that it was fully maintained. Fortunately as a result of last year's thorough estate visitation and the low malaria incidence, work following on routine inspection and the scrutiny of routine returns was much less onerous.

The report on Medical Supervision on Estates to the Health Board in the previous year has had a very beneficial effect in attracting the interest and gaining the co-operation of the planting community, especially regarding anti-malarial control. The necessity of maintaining such control on each individual estate in the interest of the remainder has been emphasised. During the year the Health Board continued to implement the recommendation of the report noted above.

One group attempted to organise an improvised ambulance for the transport of sick to hospital. Hospital staffs were brought up to scheduled strength. Anti-malarial schemes to include groups of small holdings were drawn up and Government voted \$1,000.00 to the Health Board towards initiating and carrying out a trial of one scheme. A separate detailed report was made on the experiment to Government. It may be said to have been encouraging and worthy of further trial in suitable areas.

As reported before, to aid in Medical Supervision, each group was asked to employ a (Royal Sanitary Institute) Certificated Inspector. This is a great advance, and, where tried, has been successful. It relieves the Group Medical Officer of much routine work which deprived the group of his services on more urgent affairs. At the same time each group was requested to employ a minimum number of mosquito collectors. This has enabled the larger group to do organised malarial surveys on the smaller holdings.

The newly organised Mosquito Laboratory in this Department has already commenced to serve as a training ground for dressers and collectors who wish to gain knowledge on their own initiative.

Co-ordination between the Health Department and the Health Board is more effective than before to the advantage of both; liaison between the Group Medical Officers and the Department has been fostered—every assistance is given where possible.

E. RICE CULTIVATION.

The actual cultivation of rice in the field may be said to be the main industry of the rural poulation (excluding rubber estate coolies) which is estimated to form some 70% of the total population of the State. This and the intimate relation it bears to malaria are factors which have led to a special study which is being reported on separately.

F. MINOR TRADE AND OCCUPATIONS.

A brief survey of these will be found in the Health Survey Report outlined on page 33.

SCHOOLS. V.

This subject may be divided into two sections:

- (a) Inspection of Malay Government Schools.
- (b) Inspection of Private Schools.
- (a) 45 schools were visited as compared with 38 in the previous year. All schools in the State have been visited during 1935 and 1936. This is an advance on previous years when only a quintennial inspection was possible in certain areas. From this year's inspections the most unhealthy schools appear to be Teloi (Baling District) and Changloon (Kubang Pasu District) and Kuala Sungei Muda (Kuala Muda District). Table XI (A) (page 19) shows the remediable, preventable disease found in these schools. Attention is drawn to the high scabies rate and the high caries rate. The former is due to ignorance in the house, the latter to diet defects aided by faulty oral hygiene.

Table XII (A) (page 20) shows the spleen rate comparison by district between 1935 and 1936 among Malay children.

Special inspections of 9 schools were made by the Health Staff in connection with the Health Survey, the results of which are included in a special report.

(b) 19 Non-Malay Schools were visited at the request of the Registrar of Schools, while two large schools were visited by the Health Officer in connection with the Health Survey. Table XI (B) (page 19) and Table XII (B) (page 20) set out detailed figures.

SANITATION.

(A) MALAY SCHOOLS.

			Piped supply	Protected wells	Earth wells	Rain water		None	Total
(a)	Water supply	•••	7	30	4	2	1	1	45
			Bucket	Trend or pi	1 3VL4	ound	Surface	None	Total
(b)	Latrines	• • •	12		.9	11	2	1	45

Recommendations were made for one protected well, two bucket latrines, 8 new pit latrines, 13 new mound latrines and various minor defects.

(B) Non-Malay Schools.

Out of the 19 schools visited sanitary defects were found in all, recommendations on which were transmitted to the Registrar of Schools.

LIST OF TABLES REFERRED TO UNDER PUBLIC HEALTH SECTION.

Table

- Comparative population figures by race.
- Approximate population, Births, Deaths and Infantile Mortality for II. the Chief Towns of Kedah, 1936.
- Summary of births and birth rates by race and sex for 1936. III.
 - Summary of still-births by race and sex for 1936. IV.
 - Summary of deaths and death rates by race and sex for 1936. V.
- Deaths grouped according to age, sex and nationality, 1936.
- VII. Principal causes of death by race for 1936.
 - VIII. Infantile Mortality by race and sex, 1936.
- Malaria notification from estates 1930—1936. IX. "
 - X. Malarial Statistics from estates.
- XI. School Inspections.
- XII. Spleen rates by districts.
 - XIII. Estate figures for 1936.
- XIV. Deaths on European estates.
- XV. Deaths on Asiatic estates.
- Comparative tables for total estate population shewing total deaths XVI. and death rates for years 1934, 1935, 1936.
- Hospital admissions for 1936. XVII.
- Birth and Infantile Mortality rates on estates for 1936. XVIII.

TABLE I.

Comparative Population Figures by Race.

. [Race		1st April CENSUS 1921	1st April CENSUS 1931	Mid-year 1936
Malays Chinese Indians Non-Asiatics Others			237,031 59,403 33,004 300 8,820	286,262 78,415 50,824 411 13,779	313,871 $83,840$ $52,612$ 625 $12,956$
	Tot	cal	338,558	429,691	463,894

TABLE II.

Approximate Population, Births, Deaths and Infantile Mortality for the Chief Towns in the State of Kedah, 1936.

		ttion	BIR	THS	DEA	THS	INFANTIL	E DEATHS
Towns		Population	Number	Rate per mille	Number	Rate per mille	Number	Rate per mille
Kota Star Sungei Patani Kulim	•••	24,621 10,123 7,505	1,000 578 422	40 57 56	518 375 323	21 37 43	94 44 36	94 76 85
Approximate	e Popula	ation of A	Alor Star	by Rac	e.			
Chinese Indians Europeans	 s and E	 ur a sians 	•••	 		1,080 9,516 8,505 120 400 	$45\% \\ 39\% \\ 14\% \\ 2\%$)

TABLE III.
Summary of Births and Birth Rates by Race and Sex for 1936.

	Race	, 1		Males	Females	Total	Rate per mille
Malays		•••		6,361	6,198	12,559	40.0
Chinese	• • •		•••	1,905	1,712	3,617	43.1
Indians	• • •	• • •		971	957	1,928	36.7
Non-Asiatics	• • •			. 2	7	9	• • •
Others	• • •		(147	108	255	19.7
		Total		9,386	8,982	18,368	39.6

TABLE IV. Summary of Still-Births by Race and Sex for 1936.

	Race)		Males	Females	Total
Malays Chinese Indians Non-Asiatics	• • •	₹ 	•••	405 64 61	337 51 50	742 115 111
on-Asiatics Others		•••	•••	5	3	8
		To	otal	535	441	976

TABLE V.

Summary of Deaths and Death Rates by Race and Sex, 1936.

	Race	e		Males	Females	Total	Rate per mille
Malays Chinese Indians Non-Asiatics Others		••••		3,943 1,390 620 1 138	3,367 643 453 1 127	7,310 2,033 1,073 2 265	23·3 24·3 20·4 20·5
		Tot	al	6,092	4,591	10,683	23.0

TABLE VI.

Deaths grouped according to Age, Sex and Nationality, 1936.

Deaths by Age Groups	Sex	Europeans	Eurasians	Chinese	Malays	Indians	Others	Total
0	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	•••	• • •	121 102	424 356	102 78	11 11	658 547
4 weeks	$\left\{egin{matrix} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	•••		77 50 :	248 207	$\begin{array}{c} 18 \\ 21 \end{array}$		343 279
3 months	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	0 0 0	47 36	165 132	25 14	5 1	242 183
6 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$		• • •	25 39	153 120	34 36	5 3	217 198
1 year	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	• • •	100 83	413 422	54 57	13 8	580 570
5 years	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •		34 49	207 182	18 18	9	268 253
10 "	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	1	16 24	98 81	6 5	5 2	126 112
15 ,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	•••	26 19	105 110	14 15	3 3	148 147
20 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	 1	26 23	118 132	15 19	3 3	162 178
25 .,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	• • •	51 36	141 149	22 45	2 2	216 232
30 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array}\right\}$		• • •	62 36	194 206	47 33	6 -8	309 283
35 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	•••	73 31	163 118	55 31	2 8	293 188
40 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$		•••	93 24	204 141	55 17	10 8	362 190
45 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	• • •	•••	100 21	116 61	27 9	9	252 97
50 ,,	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	•••	•••	142 16	207 139	35 13	7 11	391 179
55 ,, and over	$\left\{egin{array}{c} \mathbf{M} \\ \mathbf{F} \end{array} ight.$	•••	•••	397 54	987 811	89 46	48 48	1,521 959
TOTAL		•••	2	2,033	7,310	1,073	265	10,683

TABLE VII.

Principal Causes of Death by Race for 1936.

				Malays	Chinese	Indians	Non-Asiatics	Others	Total
Diphtheria Old age Violence Pregnancy and child be Premature birth Malaria Enteric Dysentery and Diarrho Influenza Tuberculosis (Pulmona Tuberculosis (Others) Leprosy Syphilis Ankylostomiasis Fever Unspecified Cancer Beri-beri Heart and Circulation Pneumonia Other lung diseases Convulsions Other causes	æa			847 49 224 754 756 9 75 40 36 1 1 9 292 2,909 6 133 8 33 219 799 110	Chinese 6 113 38 41 165 241 3 71 9 73 11 21 18 537 10 63 74 55 135 227 122	42 46 20 163 171 3 70 5 54 7 10 8 124 9 36 119 43 66 77		26 4 6 20 28 4 4 3 1 8 131 1 9 12 8	Total 6 1,028 137 291 1,102 1,198 15 220 58 166 19 1 41 325 3,701 16 206 118 207 406 1,104 317
		Total	• • •	7,310	2,033	1,073	2	265	10,683

TABLE VIII.

Infantile Mortality by Race and Sex, 1936.

	Race				Males	Females	Total	Rate per mille
Malays Chinese Indians Non-Asiatics Others		•••		•••	990 270 179 21	815 227 149 	1,805 497 328 37	144 137 170 145
			Total	• • •	1,460	1,207	2,667	145

TABLE IX.

Malaria Notifications from Estates, 1930—1936.

	Year		Hospitals	Lines	Total
1930	•••	•••	3,442	16,495	19,937
1931	• • •	• • •	3,229	9,600	12,829
1932	• • •	• • •	2.917	7,891	10,808
1933	• • •		4,894	9,484	14,378
1934	•••	•••	4,846	9,199	14,045
1935	* * *	•••	8,629	9,571	18,200
1936	• • •	• • •	5,701	4,676	10,377
			J		

TABLE X.

Malaria Statistics.

Holdings	lation	Cases notified spiritures of the contraction of the			Malarial deaths			deaths		e cases ad- Hospital	cases Hospi nce pe		se fata percen		dea	rcent alari aths l dea	al of	death rate mille	
Holumgs	Popu	Hospitals	Lines	Total	Hospitals	Lines	Total	Hospitals	Lines	Total	Percentage mitted to	Percentage mitted to 1 Case incider mille	Hospital	Lines	Total	Hospital	Lines	Total	Malarial d
·	36,016 10,719	5,320	4,209	9,529	85 9	6	91 20	522	169 47	691 69	55·7 44·8	264.6		·1 2·3		16·3 40·9		13·2 29·0	2.5
Total	46,735	5,701	4,679	10,380	94	17	111	544	216	760	54.9	222.1	1.6	.3	1.9	17:3	7.9	14.9	2:4

TABLE XIA.

SCHOOL INSPECTIONS (MALAY).

Number of children in the Register 5,414

Number of children inspected 4,690

	Diseases		No. of Cases	Percentage	
Spleen	•••	•••		298	6.35
Anæmia	• • •	• • •	• • •	64	1.36
Not vaccinated	• • •		• • •	96	2.05
Eye diseases			• • •	7	.15
Ear diseases	• • •	• • •	• • •	4	.09
Scabies		• • •	• • •	425	9.06
Other skin diseases	• • •	• • •		10	·21
Yaws	•••	• • •	•••	31	.66
Caries class I		• • •	• • •	447	0.53
,, ,, II		•••	• • •	413	8.81
,, ,, III	• • •	• • •	0,0 0	387	8.25

TABLE XIB.

NON-GOVERNMENT SCHOOLS.

Number of children in the Register 364

Number of children inspected 189

	Diseases		No. of Cases	Percentage
Spleen Anæmia Not vaccinated Eye diseases Ear diseases Scabies Other skin diseases Yaws Caries class I ,, ,, II ,, ,, III		 •••	5 3 13 1 19 20 16	2·65 1·59 6·88 ·53 10·05 10·58 8·47

TABLE XII.

Spleen Rates by District among Malay and Non-Malay Children 1935 and 1936.

(A) Malay.

District	No. of children examined			ldren with l spleens	Spleen rate	
·	1935	1936	1935	1936	1935	1936
Kuhang Pasu	264	1,134	. 19	76	7.20 %	6.70 %
Padang Terap	73	122	2	14	2.74	11.48
Kota Star	1,641	816	92	48	5.61	5.88
Baling	411	599	63	38	15.33	6.34
Kulim	217	461	10	17	4.61	3.69
Kuala Muda	681	907	99	52	15.54	5.73
Bandar Bharu	289	248	19	29	6.57	11.69
Yen	138	503	34	30	24.64	5· 96
Langkawi	434	•••	22	•••	5.07	•••

(B) Non-Malay (Chinese and Others) Children.

				No. of chil	ldren with spleens	Spleen rate	
District		1935	1936	1935	1936	1935	1936 %
Kubang Pasu		26	18	3	•••	11.53	•••
Padang Terap	• • •	• • •	• • •	• • •	• • •	•••	• • •
Kota Star	• • •	62	96	7	3	11.29	3.12
Baling		20	• • •	3	•••	15.00	•••
Kulim	• • •	76	•••	5	• • •	6.58	•••
Kuala Muda	• • •	51	73	1	2	1.96	2.74
Bandar Bahru	• • •	35	• • •	1	• • •	2.86	• • •
Yen	• • •	48	• • •	• • •		• • •	•••
Langkawi		54	• • •	• • •	•••	•••	•••

TABLE XIII.

ESTATE FIGURES FOR 1936.

(A) Population on European Holdings.

Nationalities -		Labourers						
		Males	Females	Adults	Children	Infants	Total	
Malays Indians Chinese Javanese Others	•••	•••	1,632 12,546 842 26 77	854 6,413 32 4	257 2,494 154 7 37	851 7,609 124 4 22	148 1,851 25 1 6	3,742 30,913 1,177 .42 142
	Total	•••	15,123	7,303	2,949	8,610	2,031	36,016

TABLE XIII.

(B) Population on Asiatic Holdings.

Vati	Nationalities			Labourers		Dependents			
TVacionamics,			Males	Females	Adults	Children	Infants	Total	
Malays	•••	•••	2,411	1,767	177	1,066	159	5,580	
Indians	• • •	•••	1,125	338	133	363	46	2,005	
Chinese	• • •	•••	2,197	171	215	364	70	3,017	
Javanese	• • •	• • •	22	8	1	4 (* * *	35	
Others	• • •	• • •	69	1	8	4	•••	82	
	Total	•••	5,824	2,285	534	1,801	275	10,719	

TABLE XIV.

(A) Deaths on European Holdings.

Nationalities			Τ 1		Total		
		Labourers	Adults	Children	Infants	Deaths	
Malays	• • •	6	8	6	12	32	
Indians	• • •		8	16	12	91	127
Chinese	• • •	• • •	1	• • •	2	4	7
Javanese	•••	• • •	* * *	1		1	2
Others	•••	•••	• • •	• • •	•••	1	1
	Total		15	25	20	109	169

Still-Births on European Holdings.

Nationalities.							No. of	Still-Births.
Malays	• •	• •	• •	• •	• •	• •		1
Indians		• •	• •	0 0	• •	• •	• •	8
Chinese				• •		• •	• •	1
Javanese			• •	• •	• •	• •		
Other	• •			• •	• •	• •	• •	
						Total		<u>i</u> 0

(B) Deaths in Group Hospitals from European Holdings.

Nationalities				Total			
			Labourers	Adults	Children	Infants	Deaths
Malays Indians Chinese Javanese Others	•••	•••	 137 5 2	72 4 	 67 1 	186 3 	462 13 2
	Total	•••	144	. 76	68	189	477

O	D1 17	
Stall	Rirths	*

Malays.	Indians.	Chinese.	Javanese.		Others.
Nil	3	Nil	Nil	•	Nil.

(C) Deaths in Government Hospitals from European Holdings.

>	Nationalities		T. 1		Total		
Nationalities		Labourers	Adults	Children	Infants	Deaths	
Malays Indians Chinese Javanese Others	•••	•••	28 2 	2	7	 6 	43 2
	Total	•••	30	2	7	6	45

(D) Death Rates from European Holdings.

Nationalities '				Total population	Total deaths	Death rates
Malays				3,742	32	8.5
Indians		•••		30,913	632	20.4
Chinese	•••	•••		1,177	22	18.7
Javanese	•••	•••	•••	42	2	47.6
Others	•••	•••	•••	142	3	21.2
		Total	• • •	36,016	691	19.1

(E) Labourer Death Rates from European Holdings.

	Nationalities				Total deaths	Death rates
Malays	• • •	•••	• • •	2,486	6	2.4
Indians	•••	•••	• • •	18,959	173	9.1
Chinese	•••	•••	• • •	874	8	9.1
Javanese	•••	•••	• • •	30		•••
Others	* * *	•••	•••	77	2	25.9
		Total	•••	22,426	189	8.4

TABLE XV. (A) Deaths from Asiatic Holdings.

\T	Notice Pit		T	[.	8	Total	
Nationalities		Labourers	Adults	Children	Infants	deaths	
Malays Indians Chinese Javanese Others	•••	 	6 2 3 	5 3 1 	2 2	12 5 5 	25 10 11
	Total	•••	12	9	4	22,	47

(B) Deaths in Group Hospital from Asiatic Holdings.

No	tionalities		Lobourous		Total		
Nationaltues			Labourers	Adults Children		Infants	Fouri
Malays	•••	• • •	1		•••	•••	1
Indians	• • •	• • •	6	4	1	2	13
Chinese		• • •	1	3	1	1	6
Javanese		• • •		• • •	• • •	• • •	
Others	•••	•••	•••	•••	•••	• • •	• • •
	Tot	al	8	7	2	3	20

(C) Deaths in Government Hospitals from Asiatic Holdings.

N-	Nationalities		Labora		DEPENDENTS				
Na			Labourers	Adults	Children	Infants	Total		
Malays Indians Chinese Javanese			2		•••	•••	2		
Others	• • •	• • •	····	•••		•••			
	To	otal	2	•••	•••	•••	2		

(D) Death Rates from Asiatic Holdings.

	National	ities		Population	Deaths	Death rates
Malays Indians Chinese Javanese Others	•••	•••	•••	5,580 2,005 3,017 35 82	26 25 17 	4·6 12·4 5·6
		Total	• • •	10,719	69	6.4

(E) Labourers Death Rates from Asiatic Holdings.

Nationalities				Labourers	Deaths	Death rates	
Malays Indians Chinese Javanese Others	•••	•••	•••	4,178 1,463 2,368 30 70	7 10 4 	1·7 6·9 1·5 	
	•	Total	•••	8,109	22	2.8	

TABLE XVI.

Comparative Tables for total Estate population showing total Deaths and Death Rates for the years 1934, 1935 and 1936.

1934.

No.	Class of Estate	Population	Death in lines	Death in Hospitals Govt. Groups		Total Deaths	Death Rates	Total Death Rates
1 2	European owned Asiatic ,,	14.060	168	34	390 36	592 98	20·2 6·5	•••
	Total	.44,295	229	35	426	690	•••	15.5

1935.

No.	Class of Estate	Population	Death in lines	Deaths in Hospitals Govt. Groups		Total Deaths	Death Rates	Total Death Rates
1 2	European owned Asiatic ,,	36,619 12,901	222 51	43	598 32	863 87	23·6 6·7	. •••
	Total	49,520	273	47	630	950	•••	19.2

1936.

No.	Class of Estate	Population	Death in lines	Deaths in Hospitals Govt. Groups		Total Deaths	Death Rates	Total Death Rates
					Groups			
1 2	European owned Asiatic	36,016	169 47	45	477	691 69	19.2	•••
~	Asiauc ,,	10,113	71	~	. 20	0.0	04	•••
]
	Total	46,735	216	47	497	760	•••	16.3

TABLE XVII.

Hospital Admissions for 1936.

Class o	of Estates		Government	Group	Total
European owned	4	•••	577	15,599	16,176
Asiatic owned	•••	•••	50	786	836
	Tot	tal	627	16,385	17,012

TABLE XVIII.

(A) Birth Rates and Infantile Mortality Rates on European Estates.

	Nation	alities		Population	Births	Birth rate	Infantile deaths	Infantile mortality rate
Malays	•••	•••	• • •	3,742	67	17:90	9	134
Indians	•••	•••	•••	30,913	1,337	43.25	256	191.4
Chinese	•••	•••	•••	1,177	13	11.05	7	538
Javanese	•••	•••	•••	42	3	71.43	1	333
Others	•••	•••	• • •	142	•••	•••	1	•••
		Total	• • •	36,016	1,420	39.4	275	193.

(B) Asiatic Estates.

	Nationa	alities		Population	Births	Birth rate	Infantile deaths	Infantility mortality rate
Malays	•••	•••	• • •	5,580	45	8.06	11	244
Indians	• • •	•••	• • •	2,005	22	10.97	5	227
Chinese	•••	•••	•••	3,017	39	12.93	5	126
Javanese	•••	•••	• • •	35	• • •	•••	•••	•••
Others	•••	•••	• • •	82	•••	•••	•••	•••
		Total	•••	10,719	106	9.8	21	199

VI. MATERNITY AND CHILD WELFARE.

It must be remarked at the outset that an exclusive Welfare Service as meant by that term in other and more developed parts of Malaya is non existent in Kedah. There is no staff specially detailed for the work; indeed it would have been of little use to commence proper Welfare work by employing Health Visitors, etc., when the midwifery service in the State is in such a primitive condition. The advice of Health Visitors could not possibly bear any fruit when midwifery cases outside Government hospitals are attended to by unqualified bidans, and when a few (perhaps qualified) midwives under no disciplinary control by registration, etc. carry out their private practice in the larger towns.

This state of affairs is being remedied by what is considered the first step towards the construction of an organised Maternity and Infant Welfare Service, namely by establishing a Kampong midwifery service employing as many midwives as possible and by enacting legislation to control the activity of private midwives practising within Sanitary Board Areas.

The midwife is the foundation of all such services. As and when midwifery practice is brought under control, the next step (Health Sisters, Health Visitors, etc.) can be instituted beneficially.

The above statement may lead one erroneously to conclude that nothing in this branch of Preventive Medicine is done in Kedah. On the contrary a vast amount of useful work in this direction is performed directly or indirectly by the Lady Medical Officer who is stationed at Alor Star, and who is in charge of the female wards at the General Hospital, the female section of all the out-door dispensaries in North Kedah and

the Malay Women's Clinic at Alor Star. Professional calls for clinical or obstetrical attendance on the families of Government Officials in the district are also answered by her or by the "out-door" midwife detailed for such work; these calls constitute the "out-door" cases and "home" visits hitherto reported under this heading. After these explanatory remarks, figures given can be interpreted in their correct perspective, bearing in mind that the real good achieved by the Lady Medical Officer as the result of her advice on ante-natal measures, infant feeding, etc., to women who attend her clinics cannot be assessed from the figures given here; attention, however, must be drawn to it, if only to stress the point that everything possible is being done.

The following figures give some of the work performed by the Lady Medical Officer during the year.

Visits to Homes:—						
1st Visits		× .				428
Revisits	• •	• •	• •	• •	• •	1,036
Outpatients Departmen	t, Genera	l Hospital	l:—			
1st Attendances	• •					896
Repetitions	• •	• •	• •	• •	• •	1,044
Malay Women's Clinic:						
1st Attendance	• •		• •	• •		427
Repetitions	• •	• •	• •		• •	795
Town Dispensary, Alor	Star:-					
1st Attendance				• •		2,465
Repetitions	• •	• •	• •	• •	• •	3,209
Other Outstation Dispe	nsaries:-	_				
1st Attendance	• •		• •	• •		482
Repetitions			• •			231

VII. HOSPITALS AND DISPENSARIES.

A total of 18,160 patients were treated in all hospitals and prison sick wards. The deaths numbered 894 giving a percentage of 4.92%. 246 deaths occurred within 48 hours of admission; excluding these, the death rate was 3.56%.

The following table gives the number treated, with deaths, for the past six years:—

	Year		No. treated	Deaths .	Percentage of deaths
*000			77.000	7 7 7 7 7	0.10
1930	***	•••	17,800	1,155	6.48
1931	• • •	•••	12,695	748	5.81
1932	•••	•••	12,473	596	4.77
1933	• • •	•••	13,617	646	4.74
1934	•••	• • •	14,367	739	5.14
1935	* * *	•••	18,401	799	4.34
1936	• • •	• • •	18,160	894	4.92

The following table gives the number of cases treated at Out-Door Dispensaries, as well as number of cases treated by the Travelling Dispensaries:—

	New cases	Repetitions	Total
Out-door Clinic Hospital, Alor Star	9,120	2,266	11,386
Out-door Dispensary, Alor Star Town	12,097	9,792	21,889
" Changloon	2,265	188	2,453
", ", Kuala Nerang	4,720	937	5,657
,, Yen	6,396	2,931	9,327
,, , Jitra	1,904	220	2,124
Malay Women & Chi dren Dispensary, Bakar Bata	427	795	1,222
Out-door Clinic, Hoslpital, Sungei Patani	6,068	529	6,597
,, Baling	3,946	779	4,725
Out-door Dispensary, Sik	3,050	124	3,174
" Clinic, Hospital, Kulim	7,222	1,613	8,835
,, Dispensary, Bandar Bahru	1,994	377	2,371
,, Clinic, Hospital, Langkawi	3,573	692	4,265
" Dispensary Padang Matsirat	1,794	184	1,978
Motor Travelling Dispensary, North Kedah	11,936	2,168	14,104
,, ,, Central Kedah	5,519	614	6,133
", ", ", South Kedah …	4,926	761	5,687
Travelling Dispensary, Langkawi	822	• • •	822
Prison, Hospital, Clinic, Alor Star	1,225	4,910	6,135
", ", ", Sungei Patani …	303	1,211	1,514
Total	89,307	31,091	120,398

The following tables gives the number of Indoor sick treated during the year in the various Hospitals and Prison sick wards:—

	Hospital		No. treated	Deaths	Percentage of deaths	
Alor Star Sungei Patani Kulim Baling Langkawi		•••		6,555 5.968 4,499 387 672	296 320 232 12 34	4·51 5·36 5·15 3·10 5·05
PRIS	ON SICK V	VARDS.				
Alor Star	•••	•••	•••	79		•••
Sungei Patani	•••	• • •	***	* * *	•••	•••
		Tota	ıl	18,160	894	4.92

NATIONALITIES OF INDOOR PATIENTS.

. Natio	onalities		No. treated	Deaths	Percentage of deaths		
Europeans	•••	•••	10	•••			
Eurasians	•••	•••	12	•••	•••		
Chinese	• • •	•••	7,398	523	7.06		
Indians	•••	• • •	8,179	286	3:31		
Javanese	•••	• • •	25	1	.04		
Malays	•••	• • •	2,323	78	3.35		
Japanese	•••	• • •	2	•••	•••		
Others	•••	• • •	211	6	2.84		
	Total	•••	18,160	894	4.92		

The approximate average daily number of Indoor patients for the year 1936 was:—

Hospital,	Alor Sta	r		• •	• •	 317.7
,,	Langkaw	vi			• •	 39.3
,,	Sungei H	Patani				 281.0
,,	Baling			• •		 17.7
,,	Kulim			• •		 177.5
Prison Si	ck Ward,	Alor Star				 2.2
	,,	Sungei Pat	ani			 Less than 1

The average daily number of Indoor patients in Kedah Government Hospitals and Prison Sick Wards for the past 6 years was:—

1930	• •	 • •	• •	 	881.11
1931	• • •	 		 	557.86
1932		 • •	• •	 	548.10
1933	• •	 		 	678.60
1934		 		 	673.10
1935		 		 	786.10
1936		 		 	835.4

PREVAILING DISEASES—SICK INDOOR.

	•	1934			1935		1936		
Diseases	Cases	Deaths	Deaths %	Cases	Deaths	Deaths %	Cases	Deaths	Deaths %
Malaria Dysentery Venereal Diseases Respiratory Diseases (ex. Pulm. Tuber.) Pulmonary Tuber- culosis Ankylostomiasis Ulcers Wounds & Injuries Other Diseases	3,239 148 358 674 351 757 703 1,676 6,429	107 15 28 108 11 20 443	3·30 1·36 ··· 4·15 30·77 1·45 ··· 1·19 6·89	5,205 211 390 885 416 778 1,023 1,689 7,780	131 19 1 47 137 27 2 15 418	2·51 9·00 2·56 5·31 23·31 4·75 ·19 ·88 5·37	3,800 204 339 1,025 430 801 1,156 1,858 8,547	111 16 56 162 15 1 27 506	2·65 15·38 ··· 5·46 37·67 1·87 ·08 1·45 5·92
Total	14,367	739	5.14	18,401	799	4.34	18,160	894	4:92

MENTAL DISEASES.

Kedah patients at the Central Mental Hospital, Tanjong Rambutan, 1936.

	Sex			Remained	Admitted	Readmitted	Total	Discharged	Died	Absconded	Repatriated	Remaining
Males	•••		•••	190	71	•••	261	44	8	1	6	202
Females	•••		• • •	70	16	•••	86	12	5	•••	•••	69 ·
		Total	•••	260	87	•••	347	56	13	1	6	271

LEPROSY.

Figures of Kedah patients in various Institutions.

Settlement	Remained	Admitted	Total	Discharged	Transferred	Absconded	Died	Remaining
		l.						
Pulau Jerajak	134	34	168	2	•••	3	21	142
Female Settlement, Penang	8	3	11	• • •	• • •	2	• • •	9
Federal Leper Settlement, Sg. Buloh	11	14	25	• • •	• • •	2	1	22
Leper Asylum, Kuala Lumpur	$\frac{1}{1}$ 5	• • •	5	• • •	• • •	• • •	•••	. 5
Total	158	51	209	2	•••	7	22	178

LABORATORIES AT KEDAH HOSPITALS.

The number of specimens examined during the year was:

Alor Star	• •			• •			12,224
Sungei Pat	ani	• •	a a	• •	• •		21,081
Langkawi	• •	• •	• •		• •		1,264
Baling	• •	• •		• •	• •		222
Kulim	• •	• •	• •		• •	• •	10,143
					Total		55,932

POST MORTEMS.

The number of post mortems performed was as shown below:—

The state of the s		•				
				Med	lico-legal.	Pathological.
Alor Star					61	5
Sungei Patani					64	5
Langkawi					2	2
Kulim		• •	• •		39	7
Baling '	• •	• •		• •		
			Total		166	19

MAJOR OPERATIONS.

The following numbers of major operations were performed at the hospitals indicated:—

Alor Star					• •		146
Sungei Patani				• •	• •	• •	88
Kulim	• •	• •		• •	• •	• •	41
Langkawi		• •	• •	• •	• •	• •	• •
Baling	• •	• •		• •	• •	• •	
					Total		275

Total .. 275

VACCINATIONS.

NORTH KEDAH.

Hospital and District vaccinations			* *		4,023
Out-door Dispensary, Alor Star town					864
" Yen	• •		• •		1,012
" Changloon	• •		• •		180
" Kuala Nerang	• •				317
Prison hospital, Alor Star	• •				393
CENTRAL KEDAH.					
Hognital and District vessionations Viv	ala Muda				0.010
Hospital and District vaccinations, Kua	aia Muda	• •	• •	• •	2,819
,, ,, Bali	ng				1,984
Out-door Dispensary, Sik					245
South Kedah.					
Hospital and District vaccinations					2,410
Out-door Dispensary, Bandar Bahru		• •		• •	42
Langkawi.					,
Hospital and District vaccinations	• •				296
Estate vaccinations done by the Health	Branch				592
			Total		15,177

HEALTH OF GOVERNMENT, OFFICIALS.

The following table gives the Health Statistics of Government Officials, other than Subordinates, in Kedah:—

		E	uropean.	Asiatic.
Number of officials resident	• •	 	73	77
Average number resident		 	47 .	74
Total number on sick list		 	13	36
Total number of days on sick list		 	86	428
Total number invalided		 	nil	nil
Total deaths		 	nil	2

VIII. GOVERNMENT PATHOLOGICAL LABORATORY.

The total number of specimens examined in 1936, by the Central Laboratory alone, in addition to the figures given on page 29 amounted to 8,912, exceeding that examined in 1935 by 1,063. Of this total the Estate Hospitals were responsible for 1,406 as compared with 899 in 1935; and 225 specimens (as compared with 193 in 1935) were received from the Police.

Another feature which may be noted is that while simple laboratory procedures, like examination of blood smears, have markedly decreased, the demand for the more time consuming tests have increased: for example, only 142 blood smears were examined in 1936 as compared with 704 in 1935; on the other hand, the figures for Kahn and Wassermann reactions have increased from 2,963 to 3,648; those of blood sugar estimations from 7 to 28 and those of blood urea estimations from 8 to 50. It will thus be noted that there has been a considerable extension in the use of the laboratory, and there can be no doubt that with the inclusion of Perlis as a new contributor of specimens, the figures for 1937 will be still higher.

The total revenue obtained amounted to \$268.00 as compared with \$145-57 received in 1936.

The following is an outline of the work done in 1936:—

Blood Sugar					28
Blood Urea	• •		• •	• •	50
Wan dan Danah Danation	• •	• •	• •	• •	$\frac{50}{2}$
Pland Iron	• •	• •	• •	* *	
TIL TO A: A:	• •	• •	• •		9
	• •	• •	0 0		8
Blood Counts					5
Blood Smears		* *	• •		142
Blood for Culture					7
Urine: Routine					29
Urine smears					3
Urine for Culture					82
Stool for Ova etc. (parasites)					15
Stool for Analysis					11
					117
Test . Meals					12
C.S.F. Estimation of Chloride		• •	• •	* *	1
COTIC CI	• •	• •	• •	• •	$\frac{1}{2}$
CCT TOD		• •			6
		• •	• •	• •	_
Sputum: Routine	• •		• •	• •	44
Pus for Culture					2
Throat Swabs	• •				172
Nasal Swabs	• •				20
Vaginal smears		• •	• •		1
Ears smears	• •	• •			1
Urethral smears		• •			2
Pus smears		• •			3
Preparation of Autovaccines		• •			8
Wassermann Reactions (C.S.F.					2
Kahn Reactions (C.S.F)	•	• •			2
Wassermann Reactions (Blood)			* *	• •	3,648
Kahn Reactions (Blood)		• •	• •	• •	3,648
· · · · · · · · · · · · · · · · · · ·			• •	• •	294
· · · · · · · · · · · · · · · · · · ·		• •	• •	• •	
Weil-Felix Reactions	TT7 - 2	• •			174
Bacteriological Examination of		• •	• •	• •	79
· · · · · · · · · · · · · · · · · · ·	Milk	• •	• •	• •	1
Histological Examinations	• •	• •	• •		56
Animal Experiment					1
Police Exhibits (Human Blood)					186
,, ,, (Animal Blood)					4
(Spermatozoa)					20
,, ,, (DDCI IIIacozoa)					
(Pug)			• •		1
" " (Pus)	• •		• •		1
(Pug)		• •			
" " (Pus)	• •		• •	• •	1 14
" " (Pus)	• •		• •	• •	1
" " (Pus)	• •		• •	• •	1 14
", ", (Pus) " " (Hairs)	• •		Total		1 14 8,912
", ", (Pus) " " (Hairs)	• •		Total		1 14 8,912
,, ,, (Pus) ,, ,, (Hairs) Of this total, 1,406 tests were ca	arried ou		Total		1 14 8,912 s follows
(Pus) (Hairs) Of this total, 1,406 tests were consummations	• •		Total		1 14 8,912 s follows—
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were consumer to the consumer to th	arried ou		Total		1 14 8,912
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered was sermann Reactions Kahn Reactions Widal Reactions	arried ou	 t for the Est	Total ate Hosp	itals, a	1 14 8,912 s follows— 658 658 54
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were consumer to the consumer to th	arried ou	for the Est	Total ate Hosp	itals, a	1 14 8,912
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered was sermann Reactions Kahn Reactions Widal Reactions	arried ou	of or the Est	Total ate Hosp	itals, a	1 14 8,912 s follows— 658 658 54 2 4
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were consumate the sections Kahn Reactions Widal Reactions Weil-Felix Reactions	arried out	for the Est	Total ate Hosp	itals, a	1 14 8,912
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered was sermann Reactions Kahn Reactions Widal Reactions Weil-Felix Reactions Blood for Culture Stool for Culture	arried out		Total ate Hosp	itals, a	1 14 8,912 s follows— 658 658 54 2 4
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered wassermann Reactions Kahn Reactions Widal Reactions Weil-Felix Reactions Blood for Culture Stool for Culture Threat Swabs	arried out	for the Est	Total ate Hosp	itals, a	1 14 8,912
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered wassermann Reactions Kahn Reactions Widal Reactions Weil-Felix Reactions Blood for Culture Stool for Culture Threat Swabs Bacteriological Examination of	arried out	for the Est	Total ate Hosp	itals, a	1 14 8,912
", ", (Pus) ", (Hairs) Of this total, 1,406 tests were considered wassermann Reactions Kahn Reactions Widal Reactions Weil-Felix Reactions Blood for Culture Stool for Culture Threat Swabs	arried out	for the Est	Total ate Hosp	itals, a	1 14 8,912 8,912 s follows— 658 658 54 2 4 8 5 10

Total

.. 1,406

IX. METEOROLOGICAL NOTES.

Stations recording rainfall and temperature are maintained by the Department at Alor Star, Sungei Patani, Kulim, Baling and Langkawi.

The highest total rainfall for the year was recorded by Kulim (181.11 inches) the lowest being Langkawi where only 79.7 inches were recorded. The wettest month was October at Kulim when 15.52 inches of rain fell.

The highest temperature recorded (95°) was on 7th and 13th March at Alor Star; the lowest having been also at Alor Star and in March (65°) on the 3rd). The mean temperature for March was 81.7° .

No outstanding observations of meterological importance were made, and detailed tables of figures are not considered worth the insertion in the report.

APPENDIX A.

A Health Survey of certain comparatively undeveloped and inaccessible areas in the State was carried out by Dr. Vickers and Dr. Strahan. Their report, which is being printed separately, is a mass of highly important and detailed information. In the same publication is included a special investigation of "Rice field" malaria. All that can be done here is to give the headings of the points dealt with in this report; this may serve to give an indication of the thoroughness with which Dr. Vickers and Dr. Strahan have carried out this profitable undertaking.

The report is divided in the following parts—

PART I.

Introduction.

Physiography and Climatic Conditions.

Social and Economic Conditions.

Medical and Health Administration.

Special Methods of Investigation.

Vital Statistics.

PART II.

Studies in Rice Field Malaria.

Investigation.

Method of investigation adopted.

Extension of investigation.

Importance of the investigation.

(A) Alor Star Town, North Kedah.

Distribution and Periodicity of Malaria.

Antimalarial Measures undertaken prior to, and during, the investigation.

(B) Sungei Patani Town, Central Kedah.

A. maculatus breeding in connection with Rice Cultivation.

Anti-Malarial measures in force.

Trapping and Dissection of Mosquitoes.

Light Attraction.

Discussion. .

Summary.

(C) Ravine Rice Cultivation.

Discussion.

Summary.

(D) Rice fields on the Island of Langkawi.

General Discussion and Summary on Rice Field Malaria in Kedah.

Acknowledgements.

References.

PART III.

Health and Disease in General.

(A) Malaria in General.

Social and Economic conditions in regard to Malaria.

Endemicity, Periodocity and Epidemicity.

Type of Infection.

Discussion.

Summary.

(B) Filariasis.

Conclusions.

- (C) Smallpox and Vaccinal State.
- (D) Pneumonia.
- (E) Influenza.
- (F) Diphtheria.
- (G) Intestinal Disease.
 - (a) Cholera.
 - (b) Enteric.
 - (c) Dysentery, Diarrhoea and Helminthic infestation.
- (H) Anaemias.
 - (I) Tuberculosis.
 - (J) Convulsions and Premature Births.
- (K) Malignant Disease.
- (L) Deaths due to Child Birth and Pregnancy.
- (M) Venereal Disease.
- (N) Deficiency Disease.
- (O) Goitre.
- (P) Yaws.
- (Q) Skin Diseases.
- (R) Leprosy.
- (S) Other Diseases, General Conclusions on Diseases in Kedah.

PART IV.

Nutrition: Dietary Standards amongst the Malay Rayats in Kedah.

Introduction.

Method of Investigation.

Method of Analysis

Limitations to this Investigation.

General notes on dietary standards.

Energy Requirements.

Protein Requirements.

Fat Requirements.

Protective Foods.

Carbohydrates.

Preparation of each form in all afternoon Diets.

Commentary on Diets Analysed.

General Notes.

Summary.

Assessment of the Nutrition State.

Summary.

References.

PART V.

Water Supplies.

Present position.

Conclusions and Recommendations.

PART VI.

Statistical Survey of the Urban Worker.

Final Conclusions.

APPENDIX B.

PROFESSOR TRATMAN'S REPORT ON THE ORAL CONDITION FOUND IN THE POPULATIONS OF THE MUKIMS OF SOK AND JENERI, KEDAH.

APRIL 1936.

INTRODUCTION.

The investigation reported herein was undertaken with the gracious permission of the Government of the State of Kedah. The writer accompanied the Health Officer, Dr. J. H. Strahan on his tour of inspection of the Mukims of Sok and Jeneri.

It was not possible to examine dentally in detail all persons presenting themselves at the examining stations, but a limited number were selected at random for this dental examination. Generally those examined comprised all, or nearly all, the members of the first households presenting themselves for examination. Those examined included a high percentage of children, some young adults and a few middle aged to aged adults.

In all 239 persons were examined. The examination was thoroughly done, mirrors and probes being used for each case and when necessary the daylight was supplemented by the use of electric torches. Each dental examination and recording took between five to ten minutes to complete.

Dental Caries.

Dental caries was found to be present in 114 persons out of 239 or 47.7% of those examined; this is the gross caries rate which tended to be lower in the areas most removed from outside contacts. Of these 114 no less than 65 had the deciduous teeth only affected although the majority of persons examined had some of the permanent teeth present, such as the first permanent molars, which are notoriously susceptible to caries. In a number of cases the dental caries had become completely arrested and in others partially arrested in some of the teeth with the natural supposition that in time it would probably become arrested in the remaining teeth. The percentage of case shewing caries and also complete natural arrest of the process was 15.5, thus shewing an active caries rate of only 32.2%, which is very low. If only the permanent dentition is considered, this percentage would be considerably lower still.

The average number of teeth shewing active caries, i.e., 114 cases, was only 2.1, while on the average 2.5 other carious teeth shewed complete arrest of the carious process; thus the actual amount of active caries is very small.

The locally termed Sam-Sam elements of the population shewed a rather lower incidence of caries than the purely Malay groups. This may possibly be associated with the increased use of foodstuffs additional to the staple diet of rice by them as compared with Malays.

Oral Hygiene.

This varied considerably; the children were better than the young adults and these than the old adults. No less than 130 cases were classified as fair or poor, a very high number considering the relative youth of the persons examined. Bad oral hygiene seemed to be definitely associated with the amount of betel nut chewed and it was, to me, surprising to find how much of this was chewed by even young children. Regular cleaning of the teeth by simple means such as the use of the finger or the frayed out end of a twig did not appear to have been practised at all. Inflammatory conditions of the gums were common and tartar was often present in considerable quantities.

Paradontal Disease (Pyorrhoea).

This disease in its various stages was very prevalent indeed in the adult population and seemed in a large measure directly associated with betel nut chewing, an association that has been frequently noticed by the writer amongst the population of Malaya. Paradontal disease was often found in quite an advanced state in young adults of 18 to 20 years of age, and by the age of thirty it was common to find teeth lost or at least severely loosened prior to being actually lost.

Dietary deficiency, other diseases and Dental disease.

Though the area, and in particular as far as Kampong Siput, was intensely malarious, this did not seem to have affected the calcification of the teeth, the prevalence of caries or the incidence of paradontal disease.

In the kampongs along Sungei Muda, where malaria was less rife but such things as worm infestations more common, there appeared to be no relationship between these conditions and the dental conditions.

The diet of the people and in particular that of the purely Malay groups was investigated. It would seem, by the generally accepted standards, that the diets are decidedly deficient, but it has been pointed out that the ordinary standards worked out in temperate climates may not be applicable in toto to conditions in Malaya. But this deficiency in both calories intake and in minerals did not appear to have affected the dental condition. A much more detailed investigation than was possible under the circumstances of the present investigation might reveal some connection; but this is not likely as far as caries is concerned and much more likely for paradontal disease. It seems probable that betel nut chewing, with its added ration of calcium in the form of lime, and the various plant leaves used to make up the "chews", offsets any general deficiency of calcium in the diet. This would affect the nourishment of the infants and the calcification of the teeth, as the mothers milk would contain adequate amounts of the mineral.

A certain amount of external food is brought into the area by Chinese shop keepers. The main food thus supplied was sugar in a highly refined and concentrated form, but it was difficult to assess how much of this was consumed per head of the population. In the poorest and most inaccessible areas the amount was probably very little. There is a suggestion in the detailed figures of the areas visited that increased sugar consumption is associated with a rise in the caries rate; if this could be substantiated it would be a finding common to numerous other areas of the world where the native population has been introduced to concentrated and highly refined sugar. (This is certainly one of the factors for the high incidence of caries amongst Malays in areas with good transport facilities).

Summary and conclusions.

Dental caries is of low incidence and its severity per person involved is also low. The number of permanent teeth lost from, or hopelessly attacked by dental caries is extremely low. Dental caries at the present time does not need any attention amongst these people as a serious disease.

Paradontal disease (pyorrhoea) is quite another problem. In the present state of our knowledge of the causes and treatment of this disease very little can be done for these people unless Government launches out into elaborate schemes of treatment; this is not advocated as the cost to Government would be out of all proportion to the number of people benefited. The restriction of the amount of betel nut chewed might help the condition, but this restriction is of course impracticable, and even if it was practicable it might quite well introduce more serious conditions by interfering with these people's normal modes of ingestion of minerals. I would however recommend that simple instruction in oral hygiene should be given these people by the dressers, who routinely visit the areas in question. Regular rinsing of the mouth after food and the use of suitable twigs with frayed out ends as tooth brushes could be advocated, and would, I think, appreciably reduce the rate of progress of the disease in the average case.

REPORT OF THE MEDICAL DEPARTMENT, PERLIS.

FOR THE YEAR 1936.

->0<----

I. ADMINISTRATION.

(a) STAFF.

The principal appointments are:—

The State Surgeon, Kedah, who visits the State once a month and more often if required.

An Assistant Medical Officer.

An Assistant Health Officer.

A Hospital Assistant, Grade I.

One Dresser Grade II.

Two Dressers Grade III.

A Vaccinator.

A Mosquito-Larvae Collector and Identifier.

One Midwife.

(b) CHANGES IN STAFF.

The newly-created post of Assistant Health Officer was filled on 15th December, by the appointment of Dr. N. Paramanathan. An additional Dresser (Grade III) was appointed on 4th June.

The Sanitary Inspector was temporarily transferred to the Medical Department to assist in carrying out certain anti-malarial measures.

(c) FINANCIAL.

Revenue collected	• •		 	 \$1368.18
Expenditure				
Personal Emoluments		• •	 • •	 \$13,568.81
Other Charges			 • •	 \$16,065.45
			Total	\$29,634.26

(d) MEDICAL INSTITUTIONS.

State Hospital, Kangar 66 Beds.

Outdoor Dispensary, Kaki Bukit, opened on November, 14th. Railway Outdoor Dispensary, Padang Besar (administered by the Railway Authorities).

There is an Outdoor Dispensary at Kangar Hospital. A Travelling Dispensary pays regular fortnightly visits to Schools, Villages, Cooly lines and Police Stations accessible by roads and paths.

(e) BUILDINGS.

. The following new buildings and works were completed during the year:-

Out-door Dispensary, Kaki Bukit.

Ward for the accommodation of Phthisis cases.

Two Malay Huts within Kangar Hospital Grounds.

Three cells for accommodation of mental cases and lepers.

Labour Room.

Covered-way between Labour Room and Female Ward.

Installation of a Boiler for hot water supply for Out-patient treatment.

Engine Room for Electrical Plant.

An Electric lighting system was installed in the Hospital in the middle of the year.

(f) GENERAL.

The Adviser, Medical and Health Services, Malay States, paid an official visit to the State during the last week of June.

Mr. J. S. de Villiers, the Chief Sanitary Inspector, Penang, inspected Kaki Bukit about the middle of November, and reported on the measures to be taken to improve the health and sanitary conditions of the Village and the surrounding area.

II. PUBLIC HEALTH.

Two fatal sporadic cases of Cerebrospinal Fever (Chinese mining coolies about Kaki Bukit) were admitted into the Hospital during the last quarter of 1936. The usual preventive measures were taken.

Two cases of Diphtheria (with no deaths) were admitted into Hospital.

25 cases of Chicken-pox and 3 cases of Measles (with one death) were seen during the year.

A number of cases of Influenza—mainly from Kaki Bukit—were admitted into Hospital during May.

6 cases of Enteric Fever (with two deaths) were admitted into Hospital; in the Register of Deaths, 8 deaths outside the Hospital have been ascribed to Enteric Fever.

No cases of Tropical typhus were reported.

16 cases of Dysentery with no deaths were treated at the Hospital against 20 cases with 1 death in 1935. Most (14) of them were Amoebic.

96 cases of Ankylostomiasis with 5 deaths were reported as against 56 with 3 deaths in 1935.

40 cases of Tuberculosis were admitted into Hospital with 12 deaths against 32 with 8 deaths in 1935. 42 deaths from Tuberculosis in the State were recorded against 26 in 1935.

As usual fevers account for the largest portion of the total deaths—447 against 370 in 1935. There was an increase in the number of cases admitted into Hospital for Malaria—394 against 356 in 1935, while the mortality was high being 14 against 4 in 1935.

Infantile Convulsions caused frequent deaths-150 against 88 in 1935.

Deaths from Respiratory Diseases (including Pulmonary Tuberculosis) are next in order to fevers and were responsible for 180 deaths in the State (152 in 1935).

The total death rate was 19.61—the highest so far recorded. Total deaths recorded amount to 1019, the maximum number recorded in any year. The number in 1935 was 850.

The Infantile mortality records show 218 deaths against 122 in the last year—116.64 against 79.07 in 1935.

Births during the year showed a distinct increase (1961 against 1640 in 1935), the birth rate 37.75 per mille being the highest recorded (32.09 per mille in 1935). 22 deaths were recorded as due to affections connected with pregnancy and parturition or a percentage of 1.12 to total births. The figure for 1935 was 13 deaths or a percentage of 0.794.

The large increase in the number of deaths and births notified is an indication that the public are gradually realising the significance of the Registration of Births and Deaths Enactment, 1352, which came into force on April 16th, 1934.

Towards the latter part of the year, Kangar was flooded three times viz: the last week of September and the first and last weeks of November.

Larval Surveys made by the Larvae Collector and Identifier show the prevalent types as in Appendix C (page 52).

The health of the prisoners in Kangar Gaol was satisfactory. Of the 19 prisoners who remained in the gaol at the beginning of the year and of the 140 who were admitted during the year, 29 cases were admitted into Hospital. (For further details vide Appendix B on page 51).

The health of the Government Servants was satisfactory; all were examined for signs of Pulmonary Tuberculosis and none were found to be suffering from active disease.

HYGIENE AND SANITATION.

The principal villages of the State viz: Kangar, Arau, Kaki Bukit and Padang Besar are under the control of a Sanitary Board.

(a) Anti-malarial Measures:—

Larval surveys were carried out in the Sanitary Board areas of Kangar, Arau and Kaki Bukit and mosquitoes were sent to the Institute for Medical Research, Kuala Lumpur, for identification and dissection (for further details vide Appendix D on page 53).

Anti-mosquito measures (mainly clearing, oiling and digging drains) were carried out in the Sanitary Board areas of Kangar and Kaki Bukit.

(b) Conservancy:—

The disposal of the night-soil in all Sanitary Board areas is carried out through the medium of the Sanitary Board. All villages are using the bucket system of removal, the night-soil being trenched in plots some distance away from the villages. A standard pail and three different types of latrine suitable for local conditions have been fixed by the Board and it is now obligatory for every house-owner to use the standard pail and to build latrines according to the approved designs.

A water supply was provided for the new storage shed for buckets erected during the year at Kangar.

(c) Refuse Disposal:—

Refuse is disposed of in each Sanitary Board area either by incineration or by burial. A marked improvement has been effected in the disposal of the refuse at Kangar and Arau by the construction this year of a new incinerator (a Horsfall model) at Jejawi—midway between the two villages—to which the refuse of both villages is transported by lorry.

(d) Burials:—

In previous years there has been practically no supervision exercised over burial grounds, and burials had been conducted indiscriminately and in a haphazard manner. As a result of investigations some of the undesirable burial grounds were closed and towards the end of the year, a burial ground for the hospital where burials can be done in a systematic and satisfactory manner was in course of preparation at Jejawi. Private burial grounds are also receiving attention.

(e) Water Supply:—

The three Sanitary Board areas of Kangar, Arau and Padang Besar are supplied with piped water. The water supply from the head-works to Arau and Kangar continued to be satisfactory in quality, though rather hard, the analysis being very satisfactory for a filtered but otherwise untreated supply. During the year, a number of requisitions for the installation of private water taps in two Sanitary Board areas were dealt with by the Board.

The source of the water supply at Padang Besar is a surface lake. It has been found that this supply is liable to dangerous pollution and it has been decided by the Railway authorities to install a "Bell" filtration plant early in 1937.

Kaki Bukit derives its water supply mainly from unprotected wells; the question of a pure water supply to this place will receive consideration when a more permanent site for the village has been decided upon.

(f) Kaki Bukit:—

Energetic measures were taken to improve conditions in this mining village, the inhabitants of which are saturated with malaria and the sanitation of which leaves much to be desired. An Out-door Dispensary which is open four days a week at present was erected during the year. This Dispensary has proved very popular and it is proposed to station a Resident Dresser there at an early date. A market has also been constructed in the village. The recommendations of Mr. J. S. De Villiers, who was specially invited by the Government to report on the sanitation of the village, will be carried out as far as practicable. The only practical and lasting solution to the problem presented by this village is its entire removal to a new and healthier site and a commencement was made with a scheme with this end in view at the later end of the year.

To ensure however that present improvement in the sanitary conditions of the village may not be impeded by lack of funds, a Kaki Bukit Health Fund was created towards the last quarter of the year, by levying a cess (40 cents a picul) on the tin-ore exported from the State. This fund is to be utilised solely for improving the health and for the improvement of the medical and sanitary amenities of the village, and is administered by a committee consisting of miners with the British Adviser as Chairman.

(g) Kuala Perlis:—

This is an insanitary village on the coast with a population of more than four thousand, most of whom are engaged in the fishing industry. The chief access to this place is by the Sungei Perlis from Kangar, a distance of about seven miles. With a view to improving the access to this locality and thus enable improvements to be made in the sanitary conditions obtaining, it has been decided to build a metalled road from Kangar. The earth-work for the first section of this road (from Kangar to Kayang School) and also the bridge across the Perlis river were completed towards the end of the year, and the work on the second section as far as Kuala Perlis will be completed in 1937. When this road is ready, it will not only be possible to secure a wider market for the produce of this place but it will also be possible to provide the inhabitants with an easier and quicker means of access to skilled medical aid.

The question of the provision of a pure water supply to this village has been engaging the attention of the Government for a long period, and during the year a supply has been provided. The source of water is a spring in a stream rising in the hills at Wei—about two miles from Kuala Perlis. In order to ensure the purity of the supply the original stream has been diverted and the water from the spring is impounded in a well constructed round it and thence conveyed through pipes to a concrete well on the banks of the Sungei Perlis. The water is delivered to boats through a discharge pipe either by gravitation or by use of a hand-pump. The use of the latter depends on the state of the tide.

(h) Child Welfare:—

It does not seem at present possible to estimate with any degree of accuracy the Infant Mortality in the State owing to the difficulty of ensuring the registration of all births. There is, however, no reason to suppose that it is any lower than in other Malay States.

Infant Welfare Centres and Health Visitors are very useful; but in a State like Perlis which consists mostly of *kampongs*, where conservative peasant Malays form the bulk of the kampong population and where transport is rendered very difficult by lack of access roads to many localities, the advantages that may accrue from them at present are very problematical, even though the question of finance and the initial difficulty of recruiting suitable candidates could be surmounted.

Of the two health problems—infantile mortality and maternal mortality—the more urgent and pressing one is infantile mortality. To deal with this a very obvious means lies in the utilisation of the services of skilled midwives in *kampongs* at the time of confinement—that is women who can enter every house, win the confidence of the people, render really useful help and slowly oust the "bidan" from the field. No one would be more eminently suited to be entrusted with this life-saving mission than the Malay woman herself.

With the assistance of the Government of Kedah a scheme for training kampong midwives was inaugurated and the first pupil was sent for training in October.

Prospective candidates—drawn from *kampongs* where they will be stationed when qualified—are engaged as "pupil midwives" and are trained at Kedah for a year. If the candidate passes the examination at the end of the year, she is posted either to her kampong or to a suitable kampong with a high infantile mortality as a Government Subsidised Midwife, the period of subsidy ranging from one to two years, viz: till she has worked up her own private practice. The kampong midwifery service will be entirely separate from any other Government Midwifery Service.

(i) Sanitary Board Bye-laws:—

A sub-committee was appointed to revise the enactments and bye-laws of the Sanitary Board (which were inadequate, out of date and obsolete) and bring them up to date. The sub-committee submitted their report towards the end of the year.

There has thus been steady progress in the measures taken to improve sanitary conditions in the State. With the appointment of an Assistant Health Officer, the nucleus of a Health Department in Perlis has been formed, and it is hoped that this branch of the Administration will continue to improve the public health of the State.

RABIES.

Seventeen cases of Dog Bite were reported, the first on January 6th and the last on December, 2nd. Twenty dogs were concerned in all; three were unknown stray dogs; sixteen were declared not rabid, after being kept under observation for ten days; one was killed on the spot.

The brains of two dogs were sent to the Institute for Medical Research, Kuala Lumpur, through the State Veterinary Surgeon, Kedah, and were both reported to be positive for rabies. Of the four persons bitten by dogs actually rabid or suspected to be rabid, one could not be traced and one refused treatment. The other two were sent to Alor Star Hospital for treatment.

The usual measures to combat rabies were enforced.

OFFICIALS.

The following table gives the Health Statistics of Government Officials (including subordinates) in Perlis.

,	Europeans.	Asiatics
Total number of officials resident	3	306
Average number resident	2	306
Total number on sick list	2	82
Total number of days on sick list	15	972
Average daily number on sick list	0.041	2.07
Percentage of sick to average number resident	100.00	26.80
Average number of days on sick leave for each		11.85
Average sick time to each resident	7.50	3.18
Total number invalided		2
Percentage of invalidings to total resident		0.65
Total Deaths	-	
Percentage of deaths to average resident	—	_
Number of cases of sickness con-		
tracted away from residence	—	_

SCHOOLS.

Regular fortnightly visits were made to 16 schools by the Travelling Dispensary. Of the Malay Vernacular Schools (4 girls' and 20 boys' schools) 20 boys' schools were visited by the Assistant Medical Officer with the following results:—

1.	Total	number	of	children	on	register	 	 2610
				childrer			 	 2055

No.	I	Diseases		No. of Cases	Percentage
1 2 3 4 5 6 7 8 9	Splenic enlargement Cardiovascular diseas Not vaccinated { nev vac Ear disease Scabies Yaws Other skin diseases Eye disease Caries Dental Bronchitis	se	ed t not taken 	569 6 189 57 18 182 30 75 7 1192 46	27·69 0·29 9·20 2·77 0·88 8·86 1·46 3·65 0·34 58·00 2·24

VACCINATIONS.

2661	vaccinations	WAYA	done
Znnl	vaccinations	were	uone.

Malays	 			 	2,153
Chinese	 			 	397
Indians	 	• •		 	36
Siamese	 • •	• •	• •	 • •	75
				Makal	0 001

Total 2,661

ESTATES.

The number of estates of any importance in Perlis is four, three being Asiatic-owned and one European.

11512010		0110 1	ar opean.					
	Nationality		Labo	URERS		DEPENDEN	TS	Total
	Translating		Males	Females	Adults	Children	Infants	10001
Malays	•••	•••	25	14	1	6	3	49
Indians		•••	173	101	7	63	41	385
Chinese	• • •	•••	1	•••	•••	•••	•••	1
Others	•••	• • •	•••		•••	•••	•••	•••
	Total	l	199	115	8	69	44	435

There were seven deaths among the Estate population (3 infants, one adult dependent and three labourers—all Indians). There were 21 births among the Indian Estate population. (No still births were recorded). Admission to Hospital numbered 107 with 5 deaths.

VITAL STATISTICS.

(a) The population of Perlis for the middle of 1936 determined by the balancing equation method was 51,951. (This population is arrived at by adding to the last year's figure the excess of births over deaths, since the effect of immigration and emigration on the total population may be considered to be practically negligible).

The following is a comparative table for the last six years:—

Year	Estimated Population	Births	Birth rate per mille	Deaths	Death rate per mille
1931 1932 1933 1934 1935	49,800 51,644 52,723 51,101 51,951	1,219 1,272 1,436 1,730 1,640 1,961	24·74 25·54 27·81 32·81 32·09 37·75	951 743 855 885 850 1,019	19·29 census figure 14·92 16·56 16·79 16·63 19·61

(b) Population according to race with deaths and birth rate.

~~~	Races			Approximate Population	Deaths	Death rate per mille
Eurasians Europeans Chinese Malays Indians Others (most	  ly Siamese	····		5 8 6,172 42,816 975 1,975	229 727 16 47	37.10 $16.98$ $16.41$ $23.80$
		Total	• • •	51,951	1,919	19.61

There were 218 deaths among infants under 1 year of age, the rate being 116.64 per mille.

# (c) Infant death rate for the last 6 years was:— (corrected rate)

Year.				• •	Deaths.	Rate per mille.
1931		• •	• •		179	151.18
1932	• •	• •	• •	• •	130	105.01
1933	• •	• •	• •	• •	134	96.40
1934		• •	• •	• •	139	83.43
1935	• •	• •	• •	• •	122	79.07
1936	• •	• •	• •		218	116.64

The infantile death rate per thousand births (excluding still-births) among the principal nationalities was:—

Malays	• •	• •	• •	• •	 	105.92
Chinese			• •		 • •	155.30
Indians	• •	• •	• •		 	66.67
Siamese						254 55

# (d) Births according to nationalities and sex.

	National	ity		Males	Females	Total
Eurasians	•••	•••	•••	• • •	•••	•••
Europeans	•••	• • •	•••	•••	• • •	•••
Chinese	•••	•••	•••	148	126	274
Malays	•••	•••	•••	842	757	1,599
Indians	•••	•••	•••	19	11	30
Siamese	•••	•••	• • •	33	25	58
		Total	•••	1,042	919	1,961

# (e) Still births according to sex and nationality.

	Nationa	lity		Males	Females	Total
Eurasians	• • •	•••	•••		•••	•••
Europeans	•••	•••	•••	•••	•••	• • •
Chinese	•••	•••	•••	5	5	10
Malays	•••	•••	•••	45	34	79
Indians	•••	•••	•••	•••	•••	•••
Şiamese	•••	•••	•••	2	1	3
				· ·		
		Total	•••	52	40	92

44

# (f) Distribution of deaths according to Nationalities, Sex and Diseases:

Diseases	Majavs		Chinese		Indians		Siamese		Total		Total	Rate per mille of population
	M.	F.	м.	F.	M.	F.	м.	F.	M	F.		
Enteric fever Dysentery Influenza Tuberculosis, Pulmonary Other forms of tuberculosis Leprosy Syphilis Ankylostomiasis Ascariasis Fever unspecified Cancer Beri Beri Diseases of the heart Other diseases of Circulatory sys: Bronchitis Pneumonia (all forms) Demam Batok Other diseases of Resp. System Diarrhoea and Enteritis Other diseases of digestive system Convulsions Diseases of nervous sys: and sense organs Non-venereal diseases of Genito- urinary sys: Basal Diseases of pregnancy, child birth, etc. Premature birth and diseases of early infancy Old age or Senility Violence (all forms including accidents) Other causes	7 8 2 17 1160 2 19 5 60 2 1 5 1 46 3 9	3 1 10 1 1 150 11 11 17 3 6 60 7 15 57 3 4	$\begin{bmatrix} 14 \\ 1 \\ \\ 1 \\ 12 \\ \\ 50 \\ \\ 11 \\ \\ 50 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 8 \\ 1 \\ \\ 3 \\ \\ 1 \\ 7 \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 10 \\ \\ 6 \\ 7 \\ 7 \\ 8 \\ 7 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8 \\ 8$	2				15 1 4 1 1 3	22 9 2 1 31  5 1 219  14  27 29 29 16  13 75 3 18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18  18	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	27 10 2 1 41 1 5 1 406 1 1 15 40 29 48 21  21 150 3 16 13 24	0.52 $0.19$ $0.04$ $0.02$ $0.79$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.02$ $0.040$ $0.040$ $0.040$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$ $0.02$ $0.06$
Total	376	351	181	48	14	$\begin{vmatrix} \\ 2 \end{vmatrix}$	21	26	592	427	1,019	

# (g) Deaths according to Sex and Nationalities.

	National	ity		Males	Females .	Total
Malays	0 0 0	•••	•••	376	351	727
Chinese	•••	•••	• • •	181	48	229
Indians	•••	ř	•••	14	2	16
Siamese		•••		21	26	47
		Total	•••	592	427	1,019

(h) Deaths grouped according to Age, Sex and Nationality:-

	Aş	ge Groups		Sex	Europeans	Eurasians	Malays	Chinese	Indians	Siamese	Total
0	• • •	•••	•••	{ Males Females	• • •	• • •	39 33	5 7	2	$\frac{1}{3}$	47 43
4	weeks	•••	• • •	{ Males Females	• • •	•••	19 14	7 5	•••	$\begin{bmatrix} 3 \\ 2 \end{bmatrix}$	$\frac{29}{21}$
3	months	•••	•••	$\left\{ egin{array}{l} \mathrm{Males} \\ \mathrm{Females} \end{array} \right.$	• • •	• • •	18 11	$\frac{6}{4}$	•••	$\begin{bmatrix} \tilde{1} \\ 1 \end{bmatrix}$	$ \begin{array}{c}     25 \\     16 \end{array} $
6	,,	• • •	•••	{ Males { Females	• • •	•••	13 14	$\begin{bmatrix} 1\\4\\3 \end{bmatrix}$	• • •	$\begin{bmatrix} 1\\1\\2 \end{bmatrix}$	18 19
1	year	•••	• • •	{ Males { Females	• • •	• • •	40 40	$\begin{array}{c} 10 \\ 4 \end{array}$	1 1	$\begin{bmatrix} \tilde{1} \\ 5 \end{bmatrix}$	52 50
5	years	•••	• • •	$\left\{ egin{array}{l} \mathrm{Males} \\ \mathrm{Females} \end{array} \right.$	• • •	•••	18 21	$\begin{bmatrix} 3 \\ 2 \end{bmatrix}$	• • •	$\begin{bmatrix} 2\\2 \end{bmatrix}$	23 $25$
10	**	•••	•••	$\left\{ egin{array}{l}  ext{Males} \\  ext{Females} \end{array}  ight.$	• • •	• • •	10 8	$\frac{1}{2}$	• • •	• • •	11 10
15	, ,	• • •	• • •	{ Males { Females	• • •	• • •	$\frac{5}{2}$	2	• • •	$\begin{bmatrix} 1 \\ 1 \end{bmatrix}$	8 3
20	,,	•••	•••	$\left\{ egin{array}{l}  ext{Males} \\  ext{Females} \end{array}  ight.$	•••	• • •	10 15	$\begin{bmatrix} 6 \\ 2 \end{bmatrix}$	• • •		16 18
25	,,		• • •	${ m Males} \ { m Females}$	•••	•••	$\begin{array}{c} 16 \\ 11 \end{array}$	$\begin{bmatrix} 10 \\ 7 \end{bmatrix}$	$\frac{2}{1}$	1	29 20
30	,,	•••	•••	${ m Males} \ { m Females}$	•••	• • •	$\begin{array}{c c} 16 \\ 14 \end{array}$	$\begin{bmatrix} 8 \\ 2 \end{bmatrix}$	1	2	27 16
35	,,	•••	•••	{ Males Females	•••	•••	14 18	18 4	3	2	37 22
40	,,	•••	• • •	${ { m Males} \atop { m Females} }$	• • •	•••	$\begin{array}{c} 16 \\ 19 \end{array}$	20	3	$\begin{bmatrix} 1\\2 \end{bmatrix}$	40 21
45	,,	• • •	•••	{ Males Females	• • •	• • •	9 10	22   2	•••	• • •	31 12
50	, •	•••	• • •	Males Females	• • •	• • •	$\begin{bmatrix} 23 \\ 7 \end{bmatrix}$	18	•••	$\begin{bmatrix} 1\\2 \end{bmatrix}$	42 10
55	"	• • •	• • •	{ Males { Females	• • •	• • •	45 28	30	2	1	78 30
65	,,	•••	• • •	{ Males { Females	•••	•••	31 24	$\begin{bmatrix} 7 \\ 1 \end{bmatrix}$	•••	1	39 25
75	years and	l above	• • •	{ Males { Females	•••	•••	34 62	4	•••	$\begin{bmatrix} 2 \\ 4 \end{bmatrix}$	40 66
	Total	Males & Fema	ales			• • •	727	229	16	47	1,019

### III. HOSPITALS AND DISPENSARIES.

GENERAL HOSPITAL, KANGAR.

The number of indoor cases treated during the year was 1667, a slight increase over the number treated during 1935.

There were 109 deaths, being a percentage of 6.54 to total treated. Excluding 38 deaths which occurred within 48 hours of admission, the death rate was 4.36 per cent. The average duration of stay in hospital of fatal cases was 20.08 days.

The daily average number of inpatients was 60.72. The largest number of inpatients on one day (May, 29th) was 95.

Indoor patients according to nationalities.

Nationality			No. treated	Deaths	Percentage of deaths	Deaths within 48 hours
Chinese Indians	•••	• • •	964 454	90 13	9·34 2·86	33 5
falays avanese	•••	• • •	242 2 5	5 	2·07  20·00	•••
iamese	Total	• • •	1,667	109	6.54	38

There was an increase in the number of cases admitted for Malaria, Venereal Diseases, Pulmonary Tuberculosis, Ankylostomiasis, Injuries and other diseases; the number admitted for Dysentery, Pneumonia, other lung complaints and ulcers was about the same.

#### ADMISSIONS FROM ESTATES AND MINES.

The total number of patients from Estates and Mines was 140 with 14 deaths or a percentage of 10.

		Remained	Admitted	Total	Deaths	
* * *	• • •	1	30	31	. 9	
•••	•••	1	108	109	5	
Total		9	128	140	14	
	,	•••	1	1 108	1 108 109	

PREVAILING DISEASES.

		dira sathsəU mbs to arnod	<del>-1</del> 4	:	:	:	-	9		:	:	-	13	26
		Регсептаде	3.41	•	•	2.00	25.00	46.77	10.10	5.21	:	0.75	£4.€	6.54
	1936	Peaths	14		*			53	10	10		<b>—</b>	88	109
1		Cases	411	14	€X	20	44	62	66	96	57	134	869	1,667
		Регсептаge	1.06	5.88	:	•	24.14	58.82	8.33	4.92	•	1.87	2.46	5.42
	1935	Deaths	4	<del></del>	•	•	2	40,	∞	ಣ	•	c ₂	16	81
		Cases	376	17	:	35	66	68	96	61	56	107	650	1,495
		Регсептаде	4.97	•	•	80.2	22.22	58.90	6.41	4.60	•	:	6.55	8.13
	1934	Deaths	18	8			၅	43	20	4	•	:	37	114
		Cases	363	14		48	27	7.3	78	87	53	96	565	1,403
		эgsтиээчэЧ	4.68	6 6	16.67	•	12.50	34.55	4.20	10.64	•	1.92	5.55	5.90
	1933	Белеть	17	:	-	•	ಣ	19	10	50	•	83	53	81
		Cases	363	19	9	69	34.	55	119	_L	58	104	522	1,379
		Регсептяде	5.69	14.29	•	•	21.74	45.71	3.95	:		26.0	5.56	5.61
	1932	Deaths	$\infty$	-	•	•	10	16	ಣ	•	•	Н	33	62
		Cyses	297	7	70	43	46	35	92	28	51	103	<del>-</del> ‡	1,105
			*		:	:	:	•	•	•	•	:	:	
	Diseases		aria	Dysentery amæbic	Dysentery, others	Venereal Diseases	Pulmonary tuberculosis	Pneumonia	Other lung complaints	Ankylostomiasis	ers	Injuries	Other diseases	TOTAL
2			· Malaria	Dyse	Dys	Ven	Pulı	Pne	Othe	Ank	Ulcers	Inju	Oth	

Diseases		Total treated	Deaths	Percentage of deaths
Cerebrospinal Fever	•••	2	2	100.00
Diphtheria	•••	2		
Dysentery Amæbic	•••	14	•••	•••
" Bacillary …	•••	1		•••
" Type undiagnosed	•••	1	•••	
Enteric Fever	•••	6	2	33.33
Erysipelas	•••	4	•••	· ·••
Influenza		98	1	1.02
Leprosy	•••	4	•••	•••
Measles		3	1	33:33
Pneumonia		62	29	46.77
Γetanus	•••	3	2	66.67
l'uberculosis	•••	47	12	25.53
Cerebrospinal Meningitis (Pnecoccal)	eumo-	1	1	100.00
Tota	al	248	50	20.16

#### SURGICAL OPERATIONS.

1 Major operation and 294 Minor operations were performed.

# LABORATORY WORK.

Blood films were examined in 3,380 instances with the following results:—

Malaria B.T. .. .. .. .. .. .. .. .. .. 409

,,	M.T.	 • •				 284
,,	Quartan	 				 3
,,	Mixed	 	• •	• •		 73
Negative		 • •	• •			2,611
					•	 
					Total	 3,380

Other specimens examined totalled 3,287. (For details vide Appendix—A).

# POST MORTEM EXAMINATIONS.

Medico-legal	• •	 		 	10
Pathological		 	• •	 	22

Total	 32
rotar	 04

#### OUT-DOOR CASES.

			Kanga	ar Hospita	l Out-door Dispensary Kaki Bukit.
Number of new ca	ases	• •		6,95	1,069
Repetitions	• •	• •	• •	3,22	23 545
The nationalities	s who rec	eived tre	atment we	ere:—	
Malays	• •		• •	4,15	52 102
Chinese	• •	• •	• •	1,34	8 937
Indians	• •	• •	• •	1,37	5 29
Siamese			• •	3	2
Eurasians				2	3 —
Europeans		• •	• •	2	2 1
Others	• •	• •	• •	• •	6 —
			Total	6,98	1,069 

In addition to those treated at the Dispensaries, 99 cases were treated in the Kangar Gaol.

The hospital midwife attended 10 cases of confinement in houses.

Neosalvarsan injections numbered 1164 of which 947 were for yaws and 217 for other conditions.

Of the 706 new cases of yaws that were treated during the year, only a few came up for subsequent injections (vide table below):—

544 patients took only one injections.

126 patients took only two injections.

23 patients took only three injections.

13 patients took only four injections.

The Travelling Dispensary attended to 1,579 cases excluding those attended at Schools, Police Stations, Public Works Department and Sanitary Board Cooly Lines.

Five mental cases (all males) were transferred to the Central Mental Hospital, Tanjong Rambutan, during the year; three were discharged as cured during the period under review; there were 19 Perlis patients (12 males and 7 females) in that Institution at the end of 1936.

Three lepers were transferred to the Leper Settlement at Sungei Buloh in 1936; there were four Perlis Lepers in Leper Institutions outside Perlis (one at Pulau Jerejak and three at Sungei Buloh) at the end of the year.

#### APPENDIX—A.

# Laboratory Work.

	Specimens			Positive	Negative	Total
Blood (Malaria) Pus Eye Smear Nasal Smear Sputum (Tubero Stool Urine	•••	•••	•••	769 31 6 4 30 1,176 111	2,611 7 7 10 235 591 1,079	3,380 38 13 14 265 1,769 1,190
		Total	•••	2,127	4,540	6,667

APPENDIX—B.

Return of Sick Prisoners Admitted into Kangar Hospital, 1936.

Di	seases			Cases	Deaths		
		,					
Ankylostomiasis		• • •	• • •	3			
Boil	• • •	• • •	• • •	2	0 0 0		
Bronchitis	100	• • •	• • •	2	• • •		
Caries of Tooth		• • •	• • •	1	• • •		
Conjunctivitis	• • •		• • •	1	• • •		
astritis	• • •	• • •	• • •	1	• • •		
onorrhoeal Epididymitis		• • •	• • •	1	• • •		
,, Urethritis	• • •	• • •		1	• • •		
Iæmorrhoids	• • •	• • •	• • •	1			
nfluenza	• • •		• • •	4	• • •		
schiorectal Abscess	• • •	•••	•••	1	•••		
Ialaria, Benign Tertian	• • •	• • •	•••	2	• • •		
,, Malignant Tertiar		• • •	• • •	1	•••		
,, Type undiagnosed	1	• • •	• • •	1	• • •		
Cheumatism	• • •	• • •	•••	1	• • •		
prain		• • •	•••	1	• • •		
lcer	* * *	• • •	•••	1	• • •		
Vound	• • •		• • •	$\frac{2}{2}$	• • •		
or observation	• • •	•••	•••	2	•••		
		Total	• • •	29	• • •		

APPENDIX—C.

REPORT SHOWING THE NUMBER AND TYPES OF ANOPHELINE LARVAE COLLECTED IN PERLIS DURING 1936.

	52				
REMARKS					
sugev .A		83	24	386	492
A. umbrosus		:	:	<b>©</b> 3	c
sianenia A		:	:	:	
sisnəniqqilihq .A		15	:	128	143
-smisq insatis. A sut		:	17	•	17
suminim .A		•	ಣ	:	ಣ
siznəyalam .A		•	•	4	4
sutsinosm .A		•	30	:	30
survhqsoonsl .A		•	7	:	14
А. косілі	•	106	15	412	533
A. karwari		:	10	:	10
muroflæfusni .A		:	40	:	40
A. hyrcanus		16	14	187	217
ansordmursd .A		:	ic -	:	15
airtsoridasd .A		61	32	383	476
A. sitkeni		:	6	:	6
A. aconitus		17	:	16	33
		•	:	:	al
FOUND AT		Aran	Kaki Bukit	Kangar	Total

# APPENDIX—D.

Report showing the number and types of Mosquitoes sent to the Institute for Medical Research, Kuala Lumpur, for Identification and Dissection in 1936.

PLACES		A. aconitus Don	A. barbirostris Wulp	A. hyrcanus V. nigerrimus Giles	V. sinensis Wied	A. kochi Don	A. philippinensis Ludl.	A. subpictus V. malayensis Hacker	A. vagus Don	Remarks.
Kangar Arau	•••	2	28	44	5	1	77	1	24 16	None were found infected
Total	• • •	2	28	44	5	1	77	1	40	



# APPENDIX—E.

#### METEOROLOGY.

Rain Fai	u.					Inches.
January				 		 4.28
February	• •			 		 0.17
March			• •	 		 4.04
April				 		 5.83
May				 		 8.53
June			• •	 		 6.27
July			• •	 		 5.59
August			• •	 		 7.92
September		• •	• •	 • •		 13.48
October			• •	 		 8.06
November		• •		 		 9.14
December			• •	 		 3.08
					Total	 76.08

The Maximum and Minimum Temperatures in the shade were 96° on 8-3-1936 and 24-5-1936, and 68° on 28-2-1936 and 29-2-1936. Greatest rainfall in 24 hours was 4.15 on 25-9-1936.



